Habitat Conservation Plan
for the
Karner Blue Butterfly and Frosted Elfin

In Support of an USFWS Incidental Take Permit

for

National Grid's New York -North Utility Activities

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LIST OF ACRONYMS

AMM	Avoidance and Minimization Measure
AMP	Adaptive Management Program
APBPC	Albany Pine Bush Preserve Commission
ATV	All-Terrain Vehicle
BMPs	Best Management Practices
CFR	Code of Federal Regulations
DOT	Department of Transportation
DPWs	Department of Public Works
EA	Environmental Assessment
EAF	Environmental Assessment Form
ECL	Environmental Conservation Law
EG	Environmental Guidance
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FE	Frosted Elfin
FERC	Federal Energy Regulatory Commission
GIS	Geographic Information Systems
GLA	Glacial Lake Albany
GLARU	Glacial Lake Albany Recovery Unit
HCP	Habitat Conservation Plan
ITP	Incidental Take Permit
IVM	Integrated Vegetation Management
KBB	Karner Blue Butterfly
kV	Kilovolts
NEPA	National Environmental Policy Act
NG	National Grid
NGO	Non-Governmental Organization
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NYSDEC	NYS Department of Environmental Conservation
NYSISO	New York State Independent System Operator
NYSPSC	New York State Public Service Commission
O&M	Operations and Maintenance
ROW	Rights-of-Way
RSP	Rome Sand Plain
RSPPRU	Rome Sand Plain Potential Recovery Unit
SEQR	State Environmental Quality Review
SHPO	State Historic Preservation Act
TNC	The Nature Conservancy
TPRU	Tonawanda Potential Recovery Unit
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
USGS	United States Geological Service

EXECUTIVE SUMMARY

This Executive Summary is a summary of the Habitat Conservation Plan (HCP). Since it is a summary, it is not the operative portion (or legally binding) portion of the HCP.

Background

This HCP has been prepared in support of National Grid's (NG's) application to the United States Fish and Wildlife Service (USFWS), for an Incidental Take Permit (ITP) pursuant to the Endangered Species Act (ESA). This HCP has also been prepared to support the New York State Department of Environmental Conservation (NYSDEC) issuance of a permit pursuant to the New York State regulations at 6 NYCRR 182, Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern; Incidental Take Permit. An ITP is required to authorize incidental take of two Covered Species, the Federally- and New York State-listed endangered Karner blue butterfly (*Lycaeides melissa samuelis*) (KBB) and New York State-listed threatened frosted elfin (*Callophrys irus*) (FE). The authorized take is associated with NG's operation and maintenance (O&M), reconstruction, and new construction activities along its electric and natural gas transmission and distribution lines.

These transmission and distribution lines are located on fee-owned or easement-based rights-of-way (ROWs) and on other lands NG may access to provide utility service to its customers. The affected or covered area is specifically located in the former Glacial Lake Albany (GLA) region of eastern New York (within portions of Albany, Schenectady, Saratoga and Warren Counties) and in the Rome Sand Plains (RSP) region of central New York (Oneida County). It is anticipated that the ITP will cover NG's covered activities for the duration of up to 50 years.

Over the last fifteen years, NG's O&M activities on ROWs involving the KBB have been conducted under a previous, Federal enhancement permit (Permit No. TE813745-1). Pursuant to the ESA and NYSDEC requirements, an HCP and ITP are now required to authorize NG's continuing utility-related activities.

Habitats of the KBB and FE are closely and uniquely associated with populations of wild blue lupine (*Lupinus perennis*). The wild blue lupine is a wild flower that generally favors open lands with sandy soils, little to no tree cover, and occasional soil disturbances (USFWS 2003). All of the life stages (*i.e.*, egg, larval, pupal, and adult) of the KBB and FE are associated with the occurrence of wild blue lupine and other nectar plant species (USFWS 2003). In addition, nectar plants and grass cover in the vicinity (200 meters) of the wild blue lupine can also provide cover and food sources for these species.

Previous studies of NG's vegetation maintenance practices have determined that decades of such ROW management is largely responsible for creating and maintaining favorable ROW habitats for wild blue lupine and the KBB/FE (Forrester et al. 2005). In areas where adjacent land development and forest succession continues to occur and expand, such managed ROWs often provide the last, remaining habitat areas for these endangered and threatened species (Forrester et al. 2005).

2006 Wild Blue Lupine Baseline Survey

In 2006, NG undertook the 2006 Wild Blue Lupine Baseline Survey that identified approximately 34 acres of wild blue lupine documented on NG utility facility rights-of-way within the GLA and RSP. This is described in greater detail in Section 1.1 of the HCP, and includes tables that provide a break-out of the 34 acres of wild blue lupine by facility type.

Development of HCP and Conservation Strategy

This HCP was developed through consultation among NG, its consultants, and the USFWS and NYSDEC. The HCP is designed to support NG's continuing activities along affected ROWs and to compensate or mitigate for potential impacts of take associated with these utility activities. This HCP is based on the 2006 Baseline Survey of Wild Blue Lupine, which identified where the largest and most contiguous areas of lupine were located along the NG ROWs and was reviewed to determine whether linkages could be made between isolated wild blue lupine patches within the ROWs or to habitats located along public lands. This Baseline Survey, and the planned periodic updates, will also identify changes in the area extent of the wild blue lupine populations, and will allow for regular evaluation of the success of the HCP. Finally, this survey and its updates will allow NG personnel to know the location of wild blue lupine and adjacent buffer areas so that the Avoidance and Minimization Measures (AMMs) identified in the HCP can be implemented.

The Conservation Strategy for this HCP (as described in greater detail in Section 4 of the HCP) is to avoid, minimize, and mitigate impacts to the Covered Species that could result from NG's covered activities and to perform mitigation and habitat enhancements. This strategy is compatible with continuing NG's covered activities and will provide long-lasting, net benefits to the Covered Species by complementing the conservation efforts of the USFWS, NYSDEC, The Nature Conservancy (TNC), and the Albany Pine Bush Preserve Commission (APBPC).

The biological goals and objectives are to complement the existing conservation efforts in New York State for the KBB and FE by a) focusing NG's mitigation/restoration/enhancement efforts within the Albany Pine Bush and Queensbury viable KBB/FE populations where corridor connections can be made and larger habitats of wild blue lupine can be developed; b) to work with non-governmental organizations (NGOs) in the area with an interest in protecting KBB/FE habitat; c) to avoid and minimize negative effects and actions; d) to promote education and outreach; and e) to ensure that the amount of habitat for the Covered Species within the Covered Lands does not drop below the 2006 Baseline Survey acreage of 34 acres.

Covered Lands

The HCP identifies a variety of categories of "Covered Lands." Covered Lands are defined to encompass all of the lands upon which the Permit authorizes incidental take of Covered Species and the lands to which the HCP mitigation measures generally apply. Different subsets of Covered Lands are subject to different requirements under this HCP.

In summary, Covered Lands for this HCP are encompassed within the following 20 USGS Quadrangles: Verona, Glens Falls, Corinth, Gansevoort, Fort Miller, Middle Grove, Saratoga Springs, Quaker Springs,

Schuylerville, Burnt Hills, Round Lake, Mechanicville, Rotterdam Junction, Schenectady, Niskayuna, Troy North, Voorheesville, Albany, Troy South, and Delmar, where NG operates either electric or gas transmission lines on ROWs or easements, and distribution lines on easements controlled by others, as well as on parcels that NG owns. Appendix C of the HCP contains figures that illustrate these areas. Section 1.2, specifically 1.2.1 and 1.2.2 describes these figures and the Covered Lands in greater depth, and how they were defined. National Grid's obligations in these areas are summarized in Table 4 of the HCP. The following is a summary of the Covered Lands subsets, broken into three larger categories:

- *Locations where Covered Species are known to be present.* These include Covered Lands - ROW with Covered Species, which are illustrated on Figures 3 through 15 in Appendix C as ROWs with red hatching. Within these ROWs are two subsets: Covered Lands A totaling 34 acres, where wild blue lupine and nectar species are known to be present; and Covered Lands B, estimated at 330 acres in size, that are associated with a 200-meter buffer area containing nectar or grass species. These areas are subjected to the most stringent AMMs discussed below. Covered Lands A and B (limited to suitable nectar/grass areas) are also subject to presence/absence surveys for KBB/FE every 2 years. Covered Lands - ROWs with Covered Species (i.e., red-hatched ROWs) are subject to surveys for wild blue lupine populations every 5 years. Such surveys may result in increases or decreases in the area of wild blue lupine.

- *Locations where Mitigation or Enhancement is proposed.* These include Mitigation associated with Covered Lands C and E, in the Queensbury and Albany Pine Bush areas, where new areas of wild blue lupine habitat will be encouraged, and enhancement associated with Covered Lands D1 and D2 in the Queensbury Area. These locations are illustrated in Appendix C, Figures 16 through 20. In these locations, additional efforts are proposed to enhance the development of KBB/FE habitat, and in these areas, the AMMs applicable to Covered Lands A and B also apply. These Covered Lands are also subject to surveys for wild blue lupine populations every 5 years and presence/absence survey for KBB/FE every 2 years in areas where wild blue lupine plants are established. Such surveys may result in increases or decreases in the area of wild blue lupine, that would then be transferred into Covered Lands A above, and into the appropriate ROW category (i.e., ROW with Covered Species). Covered Lands F involve restricting illegal ROW trespass in an area of the Glens Falls Quadrangle as illustrated on Figure 20.

- *Locations where Covered Species May Be Present.* These include Covered Lands - ROW for Survey, and Distribution Lines within the boundaries shown on Figure 2 in Appendix C. In these areas, wild blue lupine is either not known to be present based on the 2006 Baseline Survey, or, for the Distribution Lines, was not surveyed. The ROW areas are shown with blue hatch marks in Appendix C, Figures 3 through 15. In these areas, NG personnel will be aware of the potential for wild blue lupine habitat, will apply AMMs if wild blue lupine is observed, and will note the presence of the plant. The ROW areas are subject to regular 5 year surveys for wild blue lupine. If, however, after 2 consecutive rounds of surveys (i.e., surveys occur every 5 years, so after 10 years), wild blue lupine continues to not be found in these areas, these blue-hatched ROWs may be removed from the Covered Lands due to a lack of suitable habitat. The removal of these ROW areas would be considered a minor amendment.

Covered Activities and Estimate of Take

Section 2.0 of the HCP describes covered activities. The covered activities addressed in this HCP include NG's O&M, reconstruction and new construction activities associated with its electric transmission, sub-transmission and distribution facilities, and its natural gas pipeline facilities. With regard to electric and natural gas distribution facilities operated by NG along shared easements, mainly adjacent to public road or highway ROWs or on private properties, this HCP only addresses NG's activities within such ROWs and does not cover activities conducted by other entities within those same ROWs. Contractors will be required to comply with this HCP in the same manner as NG personnel, and this requirement was taken into consideration in the assessment of take.

Some of NG's activities have the potential for habitat disturbance and the direct take of the Covered Species. Potential impacts upon the Covered Species and/or upon the identified habitats may be caused by electric and natural gas O&M activities that involve vehicular and equipment operation, soil excavation/disturbance, and vegetation maintenance activities. Most of NG's O&M activities are occasional, intermittent and temporary in nature.

National Grid's vegetation maintenance program has been, and will continue to be, conducted in a manner that minimizes potential impacts to the Covered Species and that provides net benefits to their habitats. Performance of NG's vegetation maintenance program along ROWs in the Covered Lands is important to maintaining the continued existence of an early successional stage of vegetation (critical habitat) for the Covered Species.

Potential new ROW disturbances that could occur during the duration of the ITP include reconstruction and/or new construction of electric and natural gas transmission and distribution facilities. Potential impacts upon the Covered Species could result from such activities as tree clearing, slash disposal, grading, access road construction, structure fabrication and installation, and site restoration.

In addition to NG's activities, illegal ATV usage and other trespass within the ROWs may also lead to both direct and indirect effects on the Covered Species. In some areas, such illegal ATV usage of affected ROWs poses the potentially greatest threats to the habitats that occur within those ROWs.

Section 3.0 of the HCP identifies the impact analysis methodology, the evaluation of covered activities and disturbance events, and provides an estimate of take. It is not possible nor practical to estimate the loss or take of individual KBBs/FEs, including their egg, larval, pupal and adult stages, that could incidentally result from NG's covered activities or from illegal ATV usage and other trespass on the identified ROWs. For the purposes of this HCP, take of the Covered Species is therefore assumed to relate to temporary or permanent habitat disturbance or loss.

National Grid, the USFWS, and NYSDEC have no historical data or basis for calculating or estimating the potential acreage of wild blue lupine disturbances that could occur as a result of the covered activities, over an anticipated ITP duration of 50 years. Due to these difficulties, this HCP effort has utilized various, conservative assumptions to arrive at a rough estimate of potential permanent and temporary habitat disturbance. Over the life of the permit, total permanent habitat disturbance is estimated to be 3.5 acres and potential minor, temporary disturbances may occur to all wild blue lupine patches within the Covered Lands. Overall, this could result in the loss of the majority of the KBBs/FEs in varied life stages

present within the 3.5 acres of habitat that may be permanently impacted and in a nominal loss of KBB/FE's in other areas.

Avoidance and Minimization

Sections 4.1 through 4.3 of the HCP identify the implementation personnel from NG, and identify AMMs for NG's vegetation maintenance, all other covered activities, and restricting illegal trespass. Many of these same AMMs have been previously implemented by NG, during the 12 year duration of the previous Federal Fish and Wildlife Permit. Section 4.3 of the HCP lists numerous AMMs. Some of the key AMMs include:

- In advance of field work, NG will instruct applicable employees and contractors involved in covered activities about the presence and status of the Covered Species, the identification of wild blue lupine habitat and KBB/FE, the HCP and the importance of implementing AMMs. When a work order is issued, NG will also check the location against current mapping to determine where the work order is located in relationship to the Covered Lands identified above, and what level of AMMs are identified for the type of Covered Land present. In general, Covered Lands with Covered Species, and Covered Lands associated with Mitigation or Enhancement measures are subjected to the most stringent AMMs, whereas Covered Lands with the Potential for Covered Species are treated with an Awareness and Alertness Program, as described under Section 4.2.3.

- No vegetation maintenance activities are to be performed on affected ROWs, containing Covered Lands A, B, C, D or E, between April 1st and August 31st.

- During mowing activities, blades of mowers and brush hogs shall be set at least eight inches above ground level.

- Mowing of ROWs with Covered Species and/or Covered Lands A, B, C, D and E (KBB/FE habitat) shall be conducted no more than once a year.

- NG will continue to conduct security patrols and to request local law enforcement participation within the Covered Lands A, B, C, D, E, and F where ATV trespass is a known concern.

- Signs that alert NG employees and contractors to the locations of wild blue lupine within Covered Lands A, B, C, D, and E will be posted on affected portions of ROWs.

- NG will not permit incompatible uses of fee-owned ROWs containing Covered Lands A, B, C, D, and E.

- Vehicle use within ROW segments containing Covered Lands A, B, C, D, and E shall be minimized and restricted to established ROW access paths, whenever possible.

- Walking and driving directly through Covered Lands A, B, C, D, and E shall be avoided unless absolutely necessary for conducting the covered activities (in which case, any habitat disturbances shall be restored).

- NG will attempt to stop and reduce the amount of illegal ATV trespass by restricting access, where practicable, and pursuing enforcement actions. Restrictive devices such as boulders, gates, and barriers will be placed at access points or routes along the Spier-Queensbury #5-Ogden Brook Substation Tap 115kV ROW in the Town of Queensbury, Warren County. See Appendix C, Figure 20, and discussion in HCP at Section 4.3.3. National Grid will also attempt to stop illegal lawn waste dumping identified by the NYSDEC at the Queensbury-Henry St. #14 34.5kV ROW and an approximately 1-mile segment of the Spier-Queensbury #17/5 115kV ROW running east-west and crossing Dixon Road.

Mitigation and Enhancement

The mitigation and enhancement efforts provided by this HCP are strategically focused upon selected NG fee-owned ROWs and other property located in the Queensbury/Glens Falls area of Warren County and in the Albany Pine Bush area of Albany County, where the USFWS and NYSDEC believes the potential for providing HCP benefits to the covered species and their habitat is expected to be the greatest, and where there is the potential for connectivity to exiting wild blue lupine or KBB/FE populations near the NG ROWS.

Mitigation

The mitigation efforts are described in Section 4.4 of the HCP and consist of the following:

- *Covered Lands C – Five Acre Preserve:* The 5-acre preserve on NG property in Queensbury, NY, as shown on Appendix C, Figure 4, Glens Falls USGS 7.5' Quadrangle, and further illustrated on HCP Appendix C, Figures 17 and 19. This is a location where an off-site preserve will be developed for mitigation as described in Section 4.4.1. National Grid's obligations under this HCP for Covered Lands C are identified in Table 4.

- *Covered Lands E – 23 Acre ROW:* This is an approximately 23 acre area of NG ROW adjacent to Albany Pine Bush Preserve lands as described in Section 4.4.2 of the HCP and shown on Appendix C, Figure 13, Voorheesville USGS 7.5' Quadrangle and further illustrated on HCP Appendix C, Figure 16. Section 4.4.2 of the HCP describes habitat restoration activities planned in this area. National Grid's obligations under this HCP for Covered Lands E are identified in Table 4.

Enhancement

The following enhancement activities, (above and beyond required mitigation) are identified as the following four activities and are described in Section 4.5 of the HCP:

- *Covered Lands D1 – Spier-Queensbury #17/5 115 kV ROW.* As illustrated in Appendix C, Figure 17, this ROW runs north to south in the western portion of the Queensbury area between Upper Sherman Avenue and Morningside Circle, in the Town of Queensbury, Warren County. Covered Lands D is also illustrated on Appendix C, Figure 18. This ROW is approximately 12 acres in size; it is anticipated that approximately 6 acres of woody vegetative removal will be undertaken in this area. NG will modify existing vegetation management techniques within this ROW to create a grassland community that will favor the natural expansion of the wild blue lupine populations

and other nectar plant species. The primary focus of Covered Lands D1 is the elimination of woody shrubs and low-growing trees, the associated vegetation layer that would otherwise shade-out wild blue lupine and nectar species to the point that they cannot survive. Periodic soil disturbances will also be carried out in conjunction with vegetation management activities. Undesirable plant species such as poison ivy, black locust, scrub oak, and non-native grasses that have become established in areas prone to yard waste dumping will also be removed, to increase the potential for wild blue lupine and other nectar plant growth. It should be noted that the enhanced vegetation management program will still be compatible with NG's continuing O&M program and NG's existing ROW access paths and structure work areas will also be maintained so that the covered activities can be continued without constraints. This effort is described in greater detail in Section 4.5.1 of this HCP.

- *Covered Lands D2 - Spier-Queensbury #17/5 115 kV ROW and Spier-Queensbury #5-Ogden Brook Tap 115 kV ROW:* As illustrated in Appendix C, Figure 17, this ROW includes the Spier-Queensbury #17/5 115 kV ROW (see Covered Lands D-1 above) as well as the ROW that is located on the southern portion of this figure that runs from east to west between the Covered Lands C area (on the east end) and Covered Lands D1 (on the west end). The Spier-Queensbury #5 Ogden Brook Tap 115 kV ROW is also part of Covered Lands F - Restricting Illegal ROW Access. The effort associated with Covered Lands D2 is described in greater detail in Section 4.5.2 of this HCP. The focus of this effort is provide necessary grading and soil preparation and seed a native nectar species/grass seed/lupine mix at disturbance locations, ATV-damaged habitat and other open areas along these ROWs. This section of the HCP describes restoring approximately 25 acres of suitable habitat along these ROWs as an enhancement measure following successful cessation of ATV trespass (an additional enhancement measure). National Grid's obligations under this HCP for Covered Lands D are identified in Table 4.

- *Translocate Karner Blue Butterflies:* National Grid will provide access across their ROW to lands owned by others, will pay for butterfly translocation, and will contract with the APBPC to implement this enhancement measure involving a KBB translocation program. The APBPC will hire and manage a summer intern to help facilitate translocation of KBBs to an approximately 2-acre parcel that is owned by the Town of Queensbury and is currently managed by the NYSDEC. The parcel is located at the intersection of the Spier-Queensbury #17/5 and the Spier-Queensbury #5-Ogden Brook Substation Tap ROWs in the Town of Queensbury, Warren County. All efforts associated with this enhancement measure will be undertaken by others; NG responsibility is only to fund this activity and to provide access across its ROW, as needed.

- *Conduct Public Outreach:* NG will conduct periodic outreach efforts to promote awareness of NG's HCP and the effects of ROW trespass and unauthorized uses upon the Covered Species and their ROW habitats. Targeted entities will include owners of properties located adjacent to ROWs with identified trespass problems and within the priority focus areas, any local ATV clubs or organizations, local media, and local law enforcement authorities.

Combined, these measures have the potential of establishing and supporting approximately 59 additional acres of habitat for the Covered Species, over the duration of the ITP.

Monitoring, Report and Adaptive Management

Section 5.0 of the HCP describes the monitoring, reporting, and adaptive management program that will be established by NG to provide a basis for documenting HCP conformance and to continually evaluate and improve the effectiveness of the HCP, over the duration of the ITP. Monitoring of the Covered Lands to observe changes in the wild blue lupine populations recorded during the 2006 Baseline Survey and to detect potential new wild blue lupine patches will be conducted periodically (every five years) and surveys of the Covered Species will be conducted every two years.

Similar to the previous Federal Fish and Wildlife Permit requirements, an annual letter report will be submitted to the USFWS and NYSDEC, to provide information about activities conducted in support of the conservation strategies, for each year. NG will also implement an adaptive management program to evaluate the effectiveness of the HCP's conservation strategy and associated measures. As may be required by the USFWS and NYSDEC, such measures can be updated or revised to address changing circumstances or HCP needs.

Funding

Section 6.0 of the HCP provides an outline of the funding associated with implementing the HCP. The startup costs to implement this HCP are estimated at $229,000, including an estimated $180,000 of contracted services needed to:

- Develop and manage ROW habitat adjacent to the Albany Pine Bush Preserve ($50,000 of contracted services by the APBPC);
- Restrict ROW trespass and habitat damage caused by ATVs, in the Town of Queensbury, Warren County ($50,000 of contracted services for installing physical barriers);
- Restore ROW habitat damage caused by ATV trespass, in the Town of Queensbury, Warren County ($20,000 of contracted services for site restoration);
- Establish an off-ROW KBB/FE preserve on NG property, in the Town of Queensbury, Warren County ($40,000 of contracted services for site preparation and management); and
- Translocate KBBs to a Town of Queensbury property, Warren County ($15,000 of contracted services by the APBPC and $5,000 of contracted services by the Town of Queensbury or NYSDEC or APBPC).

The estimated annual cost for implementation of this HCP is approximately $56,935 during years that do not include lupine and/or butterfly survey work and up to approximately $126,935 during years that include both lupine and butterfly survey work (such as in year two, when both surveys will be initially performed; subsequently, lupine surveys will be performed every five years and butterfly surveys will be performed every 2 years). The total estimated cost to implement the HCP is approximately $5,979,200, over the 50-year ITP duration and assuming an annual 1.5% inflation rate. The actual costs over time may turn out to be somewhat more or less than those estimated in this HCP. Nevertheless, National Grid is committed to funding its HCP commitments.

Alternatives

Section 7 of the HCP describes the Alternatives reviewed. Under Section 10 of the ESA, permit applicants are required to analyze alternative actions to the taking of Federally-listed species. Alternatives considered but determined to be impractical by NG include a no-action alternative. Such a no-action alternative would involve NG ceasing all of the covered activities along the Covered Lands. Another alternative would consist of avoiding or reducing the performance of infrastructure repairs and replacements. These alternative actions were eliminated from further consideration, due to logistical and public safety considerations, and due to the associated regulatory and business-related obligations to continue providing reliable electricity and natural gas service to NG's customers.

Conclusion

This HCP provides a comprehensive conservation strategy of avoiding, minimizing and mitigating impacts to the KBB/FE and their habitats that could result from NG's covered activities, as well as providing habitat enhancements. Through implementation of the HCP's AMMs, and the proposed mitigation and habitat enhancements, NG's continuing activities will be compatible with the conservation of these Covered Species and their habitats.

Implementation of this HCP will support effective ITP coverage of NG's activities, on the affected ROWs, and will provide long-lasting, net benefits to the Covered Species by complementing the conservation efforts of the USFWS, NYSDEC, TNC, and APBPC.

1.0 BACKGROUND AND PURPOSE

This HCP has been prepared in support of National Grid's (NG's or Grid's) application to the United States Fish and Wildlife Service (USFWS), for an Incidental Take Permit (ITP) pursuant to the Section 10(a)(1)(B) of the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). This HCP has also been prepared to support the New York State Department of Environmental Conservation (NYSDEC) issuance of a permit pursuant to the Environmental Conservation Law (ECL) §11-0535 and New York State regulations at 6 NYCRR 182, Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern; Incidental Take Permit.

An ITP is required to authorize incidental take of the Federally- and New York State-listed endangered Karner blue butterfly (*Lycaeides melissa samuelis*) (KBB) and New York State-listed threatened frosted elfin (*Callophrys irus*) (FE). The authorized take is associated with NG's operation and maintenance (O&M), reconstruction and new construction activities along its electric and natural gas transmission and distribution lines (located either by fee-ownership or easement, together termed Rights-of-Way(s) (ROW[s]), on parcels of land NG owns as part of its utility services, and on other lands NG may access to provide utility service to its customers. The affected or covered area is located in the former Glacial Lake Albany (GLA) region of eastern New York (within portions of Albany, Schenectady, Saratoga and Warren Counties) and in the Rome Sand Plains (RSP) of central New York (Oneida County). Section 1.2 of the HCP defines the Covered Lands for this HCP. It is anticipated that the ITP will cover NG's covered activities for the duration of up to 50 years.

Habitats of these endangered and threatened butterfly species are closely and uniquely associated with populations of wild blue lupine (*Lupinus perennis*) (USFWS 2003). In 2006, NG undertook a Wild Blue Lupine Baseline Survey (2006 Baseline Survey) that identified approximately 34 acres of wild blue lupine documented on NG utility infrastructure-related ROWs within the GLA and RSP. At that time, it was assumed that the habitat was occupied by KBB and FE. As such, the 2006 habitat surveys can be considered valid for the purpose of estimated occupied habitat. NYSDEC conducts annual monitoring of known KBB and FE populations and no additional sites have been located since the 2006 surveys.

Given the thorough nature of the 2006 Baseline Survey and of the subsequent and on-going surveys by the NYSDEC, it is presumed that all associated ROW habitats have been adequately identified. As detailed in Section 1.2.3, Occupied Habitat, all wild blue lupine populations and all buffer areas containing nectar and grass species within 200 meters of the wild blue lupine is considered occupied habitat by the KBB and FE for the purposes of this HCP. As discussed in Section 1.2.4, Survey Updates, the 2006 Baseline Survey of wild blue lupine populations on NG lands will be updated periodically. New areas of wild blue lupine identified in survey updates will be incorporated into Covered Lands A described below, and associated nectar species buffer areas will also be modified to reflect changes in wild blue lupine populations.

The covered activities addressed in this HCP generally include NG's operation and maintenance (O&M), reconstruction and new construction activities for its electric transmission, sub-transmission and distribution facilities within ROWs, for natural gas pipeline facilities within ROWs, and also within parcels of land NG owns. With regard to electric and natural gas distribution facilities operated by NG along shared easements, mainly adjacent to public road or highway ROWs, or on private properties, this HCP only addresses NG's activities within such ROWs and does not cover activities conducted by other

entities within those same ROWs. A detailed explanation of NG's covered activities is provided in Chapter 2.0, Covered Activities. National Grid considers this HCP to be an effective approach for addressing management of its facilities and activities, in compliance with the ESA and the ECL.

1.1 Development of the HCP

The HCP development process entailed numerous discussions between NG, NG's HCP consultants, The Chazen Companies (Chazen), Shoener Environmental and Kleinfelder, and both state and federal agencies. Frequent meetings and conference calls between these entities were conducted between July 2007 and April 2011. As a result of these discussions, NG has developed a HCP that supports NG's continuing utility activities on affected ROWs. This plan promotes conservation of the Covered Species within New York recovery areas (see Section 1.1.1). This HCP relies upon a baseline survey undertaken in 2006 to identify the locations of wild blue lupine populations within NG's ROWs, as described in Section 1.1.3. The actual 2006 Baseline Survey for Wild Blue Lupine is found in Appendix B of this HCP; some figures and maps have been redacted in the version of this document circulated for public review, for the protection of KBB and FE.

This HCP has been developed to:

- Facilitate the continued, reliable, cost-effective delivery of electric and natural gas service to NG customers, in compliance with the ESA and ECL.
- Avoid, minimize, and mitigate for potential adverse effects on the covered threatened and endangered species, resulting from the covered activities.
- Provide the basis for take authorization via an USFWS ITP, pursuant to the ESA, and a permit under ECL §11-0535, pursuant to New York State regulations.

1.1.1 Karner Blue Butterfly Recovery Areas

In 2003, the USFWS finalized a formal recovery plan for KBBs with the intent to maintain and improve KBB populations throughout areas where their populations are critically imperiled (USFWS 2003). The Recovery Plan is also anticipated to provide benefits to FEs, given the similar habitat requirements of and threats to the species. As part of the Recovery Plan, the geographic area between Queensbury and the Albany Pine Bush was designated by the USFWS as the Glacial Lake Albany Recovery Unit (GLARU), which is a management area that is essential to the recovery of the listed species. Within the GLARU, the USFWS and NYSDEC have identified four potential viable population areas (Queensbury, Saratoga West, Saratoga Sandplains, and Albany Pine Bush). These four areas have been identified by the USFWS and NYSDEC as priority conservation areas. In addition to the GLARU, two other potential recovery units were also identified in New York. They are identified as the Rome Sand Plains Potential Recovery Unit (RSPPRU) and the Tonawanda Potential Recovery Unit (TPRU). This HCP includes lands in the GLARU and RSPPRU; there was no wild lupine habitat identified during the 2006 Baseline Survey in the TPRU.

According to the 2003 Recovery Plan, 70 KBB localities and 56 subpopulations have been identified within the GLARU. The subpopulations are spread throughout the priority conservation areas and include 7 subpopulations in the Albany Pine Bush, 27 in the Saratoga Sandplains, 9 in Saratoga West, 8 in Queensbury, and 5 subpopulations within isolated areas throughout the GLARU (USFWS 2003). Many of these subpopulations contain less than 10 KBBs (USFWS 2003).

Currently, KBB populations are fluctuating in areas where large patches of habitat are present. The fluctuations in the populations are likely due to a variety of issues including weather, connectivity, habitat heterogeneity, and other unknown impacts. Populations are declining in areas with small, isolated patches of habitat (NYSDEC pers. comm. 2008). The major threats to the success of KBB and FE populations in the GLARU include habitat degradation (due to invasive species and lack of habitat management for the elimination of canopy species which shade open areas) and habitat destruction/fragmentation (due to development and all-terrain vehicle (ATV) usage). To limit the impacts of these threats upon KBB populations within the GLARU, several initiatives have been implemented by local non-governmental organizations (NGOs). The Albany Pine Bush Preserve Commission (APBPC) has been vital in creating and restoring habitat within the Albany Pine Bush area, and The Nature Conservancy (TNC) has entered into a Safe Harbor Agreement with the USFWS to allow for the restoration, creation, enhancement, and management of habitat on non-Federal land in Eastern New York. In addition to the conservation efforts conducted by these local NGOs, NG's vegetation management activities within ROWs located in the GLARU have also been beneficial to the enhancement of habitat for KBBs and FEs. National Grid's vegetation management program has been documented to promote and protect suitable habitat for KBBs and FEs (Forrester et al. 2005).

National Grid's ROWs are important within the GLARU as they contain the majority of wild blue lupine habitat within the Queensbury, Warren County area, and they contain a significant portion of habitat within the other viable population areas. They also provide critical corridors for migration and linkage of isolated populations. In an 8-year study of vegetative maintenance activities conducted along ROWs located in the GLA area, wild blue lupine cover, clump size, and density of stems per clump increased following vegetation maintenance activities (Forrester et al. 2005). In addition, KBBs were also observed at wild blue lupine populations where they had previously not been observed (Forrester et al. 2005). Therefore, NG's ROW vegetation maintenance program is important to maintaining the continued existence of an early successional stage of vegetation (critical habitat) for the Covered Species along these Covered Lands and the program has a beneficial effect upon the wild blue lupine populations.

It is estimated that approximately 650 acres (includes approximately 210 acres planted by the APBPC) of wild blue lupine habitat is located within the GLARU, and approximately 34.03 acres (5%) of surveyed habitat is located within NG's transmission and shared-distribution ROWs and parcels. After discussions with the USFWS and NYSDEC, it was ascertained that wild blue lupine populations GF59-62 (8.25 acres) located along the Spier-Queensbury #5-Ogden Brook Tap 115kV ROW in the Town of Queensbury, Warren County, and many of the wild blue lupine populations located along NG's ROWs in the Albany Pine Bush (which provide linkages to other small, isolated populations) are critical populations to the recovery of KBBs in the GLARU. Enhancing and increasing wild blue lupine populations in these two locations is important to the GLARU. If successful, these wild blue lupine population-related ROWs will become corridors of wild blue habitat along which the KBB can travel. Section 4.0 Conservation Strategy, specifically Section 4.4 Mitigation Measures and Section 4.5 Enhancement Measures, discusses how these activities integrate to the overall conservation strategy under this HCP.

1.1.2 National Grid's Utility System

National Grid's utility system is located on properties NG owns and controls (fee ownership) as well as on easements which are generally located along public roadways or on private lands, and are often shared with other utilities. National Grid also owns parcels of lands on which other portions of their utility operations, such as substations, are located.

In general, electrical utility systems can be broken out into transmission lines, substations and distribution lines.

Electric power transmission or “high voltage electric transmission" involves the bulk transfer of electrical energy, from generating power plants to substations located near to population centers. National Grid considers all electric lines operating above 23 kV to be transmission and sub-transmission lines. Transmission lines typically move electricity at higher voltages (through overhead power lines) to reduce the energy lost in long distance transmission. All of NG’s electric transmission lines covered by this HCP are above ground. The majority are located on fee-owned ROW controlled by NG, although some are located on easements controlled by others.

The local wiring between a substation and the customer or end user is typically referred to as distribution lines. Distribution lines may be located on NG ROWs but more frequently are located along highway roadways owned by local municipalities or other public entities, and are often shared by other utilities and maintained by municipal Department of Public Works (DPWs). The distribution lines may also cross onto private properties where they connect to individual customers.

A list of the electric transmission utilities where wild blue lupine populations were found during the 2006 Baseline Survey is provided in Appendix B of this HCP. Distribution lines associated with shared easements along public roadways were not reviewed as part of the 2006 Baseline Survey although data available from the NYSDEC was incorporated into this survey as discussed below in Section 1.1.3, 2006 Baseline Survey of Wild Blue Lupine Habitat. Distribution lines were not surveyed because they are on easements owned by others and not under the control of National Grid.

An electrical substation is typically located between transmission lines and distribution lines. Electric substations modify the high transmission voltage to low distribution voltage using transformers. The single substation involved in this HCP is located on land owned by NG. The substation and other parcels of land owned by NG were reviewed during the 2006 Baseline Survey as discussed in Section 1.1.3, 2006 Baseline Survey of Wild Blue Lupine Habitat.

Pipelines can include transportation pipelines, which, similar to electric transmission facilities, are long pipelines with large diameters moving natural gas between cities. Distribution pipelines are composed of smaller diameter pipelines that carry the product to the final consumer. National Grid’s pipelines within this HCP are located underground. A list of the transmission gas pipelines surveyed is found in Appendix A of this HCP, and Appendix B contains tables summarizing where wild blue lupine populations were found during the 2006 Baseline Survey.

1.1.3 2006 Baseline Survey of Wild Blue Lupine Habitat

In cooperation with the USFWS and NYSDEC, in 2006, consultants for NG performed a baseline survey (2006 Baseline Survey) of wild blue lupine populations on electric and natural gas transmission lines located within the GLARU (portions of Warren, Saratoga, Schenectady, and Albany Counties), the RSPPRU (Oneida County), and the TPRU (Niagara, Orleans, Genesee, and Erie Counties), and on parcels owned by NG adjacent to those utility lines. This survey also incorporated habitat mapping performed by the NYSDEC, which in some locations, extended beyond the NG ROWs. No wild blue lupine populations were identified on NG ROWs within the TPRU. A single wild blue lupine population was identified in the RSPPRU within a distribution line.

Wild blue lupine populations were identified on NG transmission lines (electric and natural gas) and/or parcels within the following NY United States Geological Service (USGS) quadrangles: Glens Falls, Gansevoort, Quaker Springs, Saratoga Springs, Round Lake, Rotterdam Junction, Schenectady, Niskayuna, Troy North, Albany, Voorheesville, Delmar and Verona. Wild blue lupine populations were not identified on NG transmission lines (electric and natural gas) and/or NG parcels within the following NY USGS quadrangles: Medina, Knowlesville, Akron, Oakfield, Lee Center, Westernville, Rome, Warrensburg, Lake George, Lake Luzerne, Hudson Falls, Porter Corners, Fort Miller, Middle Grove, Schuylerville, Pattersonville, Burnt Hills, Mechanicville, Altamont, Troy South, Clarksville, and Ravena. Appendix A, 2006 Wild Blue Lupine Survey Report has maps illustrating all NG Transmission lines that were surveyed, including those where wild blue lupine populations were found. Due to the sensitivity of the information these maps have been redacted from the public version of this HCP.

The survey protocol/methodology for locating and surveying wild blue lupine populations during the 2006 Baseline Survey was developed by Chazen. For a detailed description of the survey protocol and results, please review Appendix A. Geographic Information System (GIS) datasets depicting the locations of NG's electric and gas ROWs within each of the aforementioned recovery units were overlain on other various GIS datasets including County Soil Surveys, National Wetlands Inventory Mapping, NYSDEC wetland mapping, USGS topographic maps; and aerial photographs. Areas omitted from the survey consist of areas along the ROWs deemed unsuitable for the growth and propagation of wild blue lupine (such as wetland areas), wild blue lupine populations previously surveyed by the NYSDEC, portions of ROWs located within heavily urbanized areas, and active agricultural areas.

During the Baseline Survey, which was conducted in mid- to late-May and early June 2006, applicable segments of NG's ROWs (see Appendix B, Tables) were traversed and positions were recorded along the perimeter of each wild blue lupine population which was greater than one square meter in area cover. The Appendix B, Tables do not include NG ROWs where wild blue lupine was not found.

For populations less than one square meter, a single position was recorded in the approximate center of the population. Areas where small multiple populations occurred (less than one square meter in size) were recorded as an aggregate population. Permanent stakes were placed within each recorded population of wild blue lupine and notes regarding the wild blue lupine population were recorded. Additionally, any KBB or FE encountered during field activities was noted. This Baseline Survey resulted in development of a detailed GIS-based dataset, which was one of the primary data sources used for development of this HCP. Wild blue lupine populations surveyed by Chazen and those populations mapped by the NYSDEC were overlain on aerial and topographic maps for analysis. For populations included in the NYSDEC dataset which overlap with populations surveyed by Chazen, the polygons were merged and the outer boundary of the merged polygon was used for acreage calculations. Populations previously surveyed by the NYSDEC and located within 200 feet on either side of the ROW, but beyond 27.5 feet from the centerline of each ROW, were also depicted on the maps.

The 2006 Baseline Survey identified a total of 129 wild blue lupine populations along NG's transmission line ROWs and adjacent NG-owned parcels. Most of these surveyed populations occur within Saratoga and Warren Counties, in the Saratoga Springs and Glens Falls/Queensbury areas. As illustrated in Table 1, 2006 Baseline Survey Summary of Wild Blue Lupine Populations By Facility, approximately 34.03 acres of wild blue lupine habitat was identified including an assumed additional one acre of wild blue lupine along distribution lines that were not surveyed. These findings are further discussed below. Appendix A,

2006 Wild Lupine Survey Report, contains Tables 3.12.1 and 3.12.2 that form the basis for this summary, and provide additional details about the ROWs and parcels.

Table 1: 2006 Baseline Survey Summary of Wild Blue Lupine Populations by Facility

Facility Type	Ownership Type	Lupine Population Size (Acres)
Electric – Transmission line ROWs	Fee Owned	13.76
Electric – Transmission line ROWs	Easement based (owned by others)	14.89
Electric – Distribution lines	Easement Based (owned by others)**	1.28*
Natural Gas – Pipeline ROWs	Fee Owned	0.66
Non-ROW Parcels		3.44
Total		**34.03**

* includes 1-acre of assumed unidentified habitat along easement-based distribution lines
** the 0.28 acre population is the one found on the Verona Quadrangle

These wild blue lupine areas are only those areas located within the ROW. In locations where the NYSDEC identified that the wild blue lupine extended beyond the limits of the ROW onto adjacent parcels, only the area within the ROW or NG Parcel is included in the acreage above. Surveyed individual populations range in size from approximately 0.000023 acre (Population NK83) to 3.04 acres (Population SS36b). The largest, aggregate population area (Populations GF59-62) consists of 8.25 acres, located in the Town of Queensbury, Warren County. The average size of the wild blue lupine populations located within the Covered Lands is 0.26 acres.

Approximately 0.28 acre of wild blue lupine habitat was identified along a distribution ROWs that NG shares with other third-party users. As the Baseline Survey only included one distribution line and since all of the remaining shared distribution lines have not been surveyed by the NYSDEC (i.e., the Queensbury area was omitted), it is probable that unidentified wild blue lupine populations are located along the portions of distribution lines not surveyed. Therefore, after discussions with the NYSDEC and USFWS regarding the total amount of wild blue lupine habitat along the distribution lines within the Covered Lands, NG has assumed that an additional one acre of wild blue lupine habitat could be located along these distribution lines. This one-acre "buffer" will ensure NG provides adequate mitigation for potential impacts upon any currently unidentified, distribution line-related wild blue lupine populations which may be identified in the future, during the life of the permit. Because of the extent of surveys completed to date, any new lupine habitat found is anticipated to be very small in size (e.g., <25 plants or <.00005 acres).

The 2006 Baseline Survey GIS datasets provided data for assessment of the effects of NG's activities on the Covered Species as discussed in Sections 3.3 to 3.5. The HCP is designed to support NG's continuing activities along affected ROWs, while promoting the KBB Recovery Areas by developing larger areas of mitigation and habitat enhancement in two specific geographic regions in order to compensate or mitigate for impacts of take.

This HCP relied on the 2006 Baseline Survey of Wild Blue Lupine as a management tool. The mapped wild blue lupine populations from the 2006 Baseline Survey were analyzed to identify where the largest and most contiguous areas of lupine were located along the NG ROWs and to determine whether linkages could be made between isolated wild blue lupine patches within the ROWs or to habitats

located along public lands adjacent to the ROWs as part of mitigation planning and habitat enhancement discussed in Section 4.0.

As discussed below in Section 1.2.4, periodic survey updates are proposed to identify changes in the area extent of the wild blue lupine populations, and, as discussed in Sections 1.2.4, 5.5, and 6.1.10, the analysis of the updated GIS database will allow for regular evaluation of the success of the HCP.

Finally, as described in Section 4.2.2 of this document, this survey and its updates will allow NG personnel to know the location of wild blue lupine and adjacent buffer areas so that the Avoidance and Minimization Measures (AMMs) identified in the HCP can be implemented.

1.1.4 Selection of Covered Activities

Covered activities are activities carried out by the Permittee on Covered Lands that may result in an incidental take of a Covered Species. For this HCP, they include all of NG's utility activities, including vegetative maintenance, reconstruction, and new construction activities on Covered Lands (see Section 1.2). Covered activities are described in detail, in Chapter 2.0, Covered Activities.

1.1.5 Duration of Permits

National Grid does not expect a major technology change in the delivery of electricity and natural gas to its customers within the next 50-years or more. The existing electric and natural gas facilities will need to remain operable and they will need to be periodically maintained, including upgrading and/or refurbishing them to continue their safe and efficient operation and function. Therefore, the duration requested for this Section 10(a)(1)(b) permit is for 50 years from the date of issuance.

1.2 Covered Lands and Subsets

Covered Lands are defined to encompass all of the lands upon which the Permit authorizes incidental take of Covered Species and the lands to which the HCP mitigation measures generally apply. This section of the HCP also identifies and defines subsets of Covered Lands which are subject to more specific requirements.

1.2.1 Figures Illustrating Covered Lands

To better understand the descriptions of the subsets of Covered Lands in this section, it may be helpful to become familiar with these areas by reviewing the Figures in Appendix C that illustrate these Covered Lands. The following is a description of these Figures.

Appendix C, Figure 1 is an overview of the 20 quadrangles in eastern and central New York that either contain wild blue lupine habitat within transmission lines ROW or have the potential to contain Covered Species within distribution lines areas. The area of 20 New York USGS quadrangles, including Verona within the RSP, and 19 quadrangles in the GLARU are illustrated in yellow. Appendix C, Figure 2 illustrates the 19 quads within the GLARU in greater detail. Of the 20 quadrangles, 13 (including the Verona Quadrangle) are labeled with a figure number since these quadrangles were identified in the 2006 Baseline Survey as containing wild blue lupine habitat within transmission line ROWs. Additionally, the 12 quadrangles in the GLARU with figure numbers and portions (shown in green) of the remaining 7

quadrangles in the GLARU have the potential for Covered Species to be present within distribution lines that are located within the green distribution line boundary.

Appendix C, Figures 3 through 15, provides the 13 USGS Topographic quadrangles where wild blue lupine was found within transmission line ROWs during the 2006 Baseline Survey. For example, the Verona Quad is Figure 3, and the Glens Falls Quadrangle is Figure 4.

Reviewing Figure 4 as a typical example, the legend notes that the figure illustrates the ROW at 800 feet wide to visually enhance the ROW locations on the map; the actual ROW width is much smaller (50 to 172 feet). Appendix B, Tables 1 and 2 provide the actual ROW widths. The types of ROW (gas or electric) are illustrated as blue and red dot dash lines along the length of the ROW, respectively except where mitigation is being proposed. Areas where lupine populations are present have been designated as Covered Lands A. A buffer area is designated as Covered Lands B. Covered Lands A and B have been combined and illustrated in brown as Covered Lands B within the ROW. The ROWs "segments" containing Covered Lands A and B and/or where mitigation is proposed, are marked with red hatching and are labeled as Covered Lands – ROW with Covered Species; these ROWs will be managed using AMMs.

Other "segments" of the ROWs are marked with blue hatching and are labeled as Covered Lands – ROW for Survey. These are locations where wild blue lupine was not found during the 2006 Baseline Survey, but where the ROW could contain Covered Species. In the ROWs hatched in blue, NG will ensure that workers are aware and alert to the potential presence of wild blue lupine (see Section 4.2.3); if lupine is identified, AMMs will be utilized and the area of lupine noted. All ROWs hatched in red and blue will be surveyed for wild blue lupine populations on a periodic basis. If however, after two consecutive surveys (i.e., conducted every five years, so 10 years total), wild blue lupine continues to be absent on the blue hatched ROWs, there is the potential for some or all of these blue hatched ROWs to be removed from the areas of covered land as a minor amendment (see Section 5.5.1, Minor Amendments).

Figure 4 also illustrates the green line indicating the boundary of Covered Lands - Distribution Lines. Distribution lines within this boundary could potentially contain Covered Species. Similar to the blue hatched ROWs described above, if lupine is identified, then AMMs will be utilized and the area of lupine noted. There are no periodic survey requirements for distribution lines.

Finally, Figure 4 illustrates an area where Detailed Mitigation and Enhancement is proposed, and cites to Figure 17. Similarly, Figure 13, the Voorheesville Quadrangle, illustrates an area where Mitigation is proposed, and cites to Figure 16.

Figure 16, Covered Lands E, APBPC Habitat Management Area, illustrates an area of mitigation within the Voorheesville Quadrangle adjacent to the Albany Pine Bush as described below.

Figure 17, Summary of Mitigation and Enhancement Measures, illustrates proposed mitigation and enhancement areas in the Town of Queensbury. These include the following:

- Covered Lands C (illustrated on Figure 20);
- Covered Lands D1 (illustrated on Figure 18);
- Covered Lands D2, which is illustrated on both Figure 17 and 20 (and includes Covered Lands D1); and

- Covered Lands F, which are ROWs where illegal trespass will be restricted, as illustrated on Figure 20, and include Covered Lands C and D2.

It is noted that for the Queensbury Mitigation and Enhancement Areas, there is some overlap of the Covered Lands C, D1, D2, and F. For example, Covered Lands F, where illegal ROW trespass is being restricted, includes Covered Lands C and D2. Covered Lands D2, which involves restoration of wild blue lupine and nectar species along ROWs, will occur on Covered Lands D1 and D2. These areas of overlap are illustrated on the figures.

1.2.2 Covered Lands

Covered Lands are defined to encompass all of the lands upon which the Permit authorizes incidental take of Covered Species and the lands to which the HCP mitigation measures generally apply. This section of the HCP also identifies and defines subsets of Covered Lands which are subject to more specific requirements.

National Grid's activities in Covered Lands and subset areas are subject to a few limited and general obligations specified in Sections 4.2, 4.3.1, 4.3.2 and 4.3.3, and 4.4, and summarized in Table 4. The obligations vary by Covered Lands subsets. National Grid also has other obligations related to HCP Implementation, Training and Site Management Information, Mitigation and Enhancement, Public Outreach, Monitoring and Reporting, Unforeseen Circumstances and Funding as identified in the main body of the HCP and summarized in Table 4.

Except for areas identified as containing hydric soils, non-sandy soils, wetlands, urbanized areas, or active agricultural lands, Covered Lands encompass all of the following lands in 20 quadrangles in upstate New York, and as shown on Appendix C, Figures 1 and 2:

- where NG's gas and electrical and transmission and distribution facilities are located;
- the lands owned by NG and/or subject to NG easements for these facilities;
- access routes to infrastructure associated with O&M activities; and
- electrical and gas distribution lines, and substations.

More specifically, the Covered Lands include NG's electric transmission system within the GLARU, which encompasses approximately 158 miles[1] and 1,915 acres of ROWs. Some of these transmission lines are located in easements along highways. They include the following facilities:

- Seventeen overhead electric transmission lines (16 115kV lines and one 230kV line) (80.4 miles);
- seven 34.5kV sub-transmission lines (77.7 miles); and
- one substation.

The Covered Lands also include NG's electric distribution lines. Many of these distribution lines (less than 23kV) are located on easements shared with other entities, generally along roadways. They may also extend onto private properties where they provide service to individual customers. Covered Lands

[1] If multiple electric transmission lines are located in parallel within a single ROW, the length has only been counted once.

may also include locations adjacent to ROWs on private properties that may be accessed to remove danger trees or other hazards. They are discussed in greater detail below under the subset Covered Lands – Distribution Lines.

Covered Lands also include NG's natural gas transmission system within the GLARU. The NG natural gas transmission system consists of four buried transmission pipelines (E18-19, E12-9, E31-3 and E31-5). The E12-9, E31-3, and E31-5 steel transmission pipelines are 12" in diameter. Pipeline E18-19 has a diameter of 16". The natural gas transmission system covers approximately 53.9 miles and approximately 163 acres of land within the GLARU-related Covered Lands. A number of these pipelines are located along highways and within easements or may be located adjacent to existing electric transmission line ROWs. Covered Lands also include NG gas distribution systems, which are located along easements or extend onto private properties. They are discussed in greater detail below under the subset Covered Lands – Distribution Lines.

The Verona Quad contains one blue lupine population, apparently located on a distribution line. The Verona Quadrangle Covered Lands are not included in the above lengths. The Verona Quad includes 0.5 miles of ROW in Covered Species, and 8.41 miles of ROW in Potential Covered Species. It appears that these lengths on the Verona Quadrangle are associated with distribution lines that are located on easements (not owned nor controlled by NG).

In addition to the electric and natural gas ROWs, Covered Lands include several parcels of land adjacent to the ROWs that NG owns, where wild blue lupine was found. These "non-ROW" parcels total approximately 30 acres.

It is important to note that the Covered Lands include all of NG's electrical and gas distribution lines, and NG-owned parcels currently known to contain wild blue lupine populations. Any future expansion activities by NG located outside of the Covered Lands that may affect KBB/FE habitat will not be covered under this HCP, and should such a situation arise, an amendment to the HCP/ITP will be required.

Covered Lands are subdivided into several subsets as described and defined below:

Covered Lands – ROW with Covered Species: These ROWs segments, illustrated with red hatching in Appendix C, Figures 3 through 15, contain wild blue lupine (KBB/FE habitat), nectar habitat, and thus, given the presence of this habitat, are going to be operated under the assumption that KBB habitat is present and occupied. There are 24.3 miles of electric transmission line ROW, 24.8 miles of electric sub-transmission line, and 11.58 miles of natural gas pipeline[2] (along the centerline) illustrated with red hatching on these figures. There are also 0.5 miles of electric distribution line easement ROW with Covered Species on the Verona Quadrangle. These areas include:

Covered Lands A- Wild Blue Lupine Habitat: The wild blue lupine habitat is identified in approximately 34 acres (see Table 1) based upon the 2006 Baseline Survey, and is illustrated on specific maps associated with the 2006 Baseline Survey. Due to the sensitivity of the information these maps have been redacted from the public version of this HCP. The extent of the known wild blue lupine habitat is described in Section 1.1.3, 2006 Baseline Survey. Appendix C, Maps, Figures 3 through 15, illustrates the location of

[2] Where multiple electric lines are located parallel in the same ROW, the length has only been counted once. Where a gas pipeline is located adjacent to an electric transmission line, both lengths have been counted.

Covered Lands B, as described below; the Covered Lands A is contained within the area illustrated as Covered Lands B. Please note that the ROW on these figures is illustrated at 800 feet wide to visually enhance the ROW locations on the maps; the actual ROW is much smaller. Covered Lands A will be adjusted based on future updates of the Baseline Survey. For example, any restored areas identified as containing wild blue lupine habitat during subsequent surveys will become part of Covered Lands A. As described below in Section 1.2.3, Occupied Habitat, for the purposes of this HCP, Covered Lands A are considered Occupied Habitat. National Grid's obligations under this HCP specific to Covered Lands A are identified in Table 4.

Covered Lands B – 200 meter Buffer Zone: This subset of Covered Lands is defined as a 200 meter buffer zone surrounding known wild blue lupine locations and, for purposes of this HCP, is confined to the NG ROWs or NG lands. In order to qualify as a buffer zone, the area must contain nectar plants and/or grass cover. Nectar plants would include such species as common milkweed (*Asclepias syriaca*), butterfly weed (*Asclepias tuberosa*), horsemint (*Monarda punctata*), strawberry (*Fragaria virginiana*), hawkweed (*Hieracium* sp.), and cinquefoil (*Potentilla* sp.) or other species identified in Appendix C of the 2003 KBB Recovery Plan. These areas are estimated to total 330 acres in size[3]. Appendix C, Maps, Figures 3 through 15, provides an approximate extent of the Covered Lands B; the ROWs shown on these figures are illustrated at 800 feet wide, and the buffer areas have not been field verified for cover type. Covered Lands B will be adjusted based on future updates of the Baseline Survey; the 200 meter buffer zone will be extended around any new areas of wild blue lupine identified in future updates of the Baseline Survey. As described below in Section 1.2.3, Occupied Habitat, for the purposes of this HCP, Covered Lands B are considered Occupied Habitat. National Grid's obligations under this HCP for Covered Lands B are identified in Table 4.

Covered Lands F – Restriction of Illegal ROW Trespass: This subset of Covered Lands will be subject to special measures to restrict illegal trespass. It is made up of three sections of ROW identified as Spier-Queensbury #17/5 ROW, Queensbury-Henry St. 14, and Spier-Queensbury #5-Ogden Brook Sub Tap. These special measures are described in Section 4.3.3 of the HCP and the areas are shown on Appendix C, Figure 4, Glens Falls USGS 7.5' Quadrangle and further illustrated on HCP Appendix C, Figures 17 and 20. Cessation of illegal ROW trespass in these areas supports the mitigation measures proposed for Covered Lands C and the enhancement measures for Covered Lands D1 and D2.

<u>Covered Lands – Mitigation:</u> *The Covered Lands that are identified below are associated with proposed mitigation measures to create wild blue lupine or nectar and grass species habitat. These areas are also shown as red-hatched ROWs.*

Covered Lands C – Five Acre Preserve: The 5-acre preserve is located off-ROW on NG property in Queensbury, NY. This area is shown on Appendix C, Figure 4, Glens Falls USGS 7.5' Quadrangle, and further illustrated on HCP Appendix C, Figures 17 and 19. This is a location where an off-site ROW preserve will be developed as mitigation as described in Section 4.4.1. National Grid's obligations under this HCP for Covered Lands C are identified in Table 4.

Covered Lands E – 23-Acre ROW: This is an approximately 23 acre area of NG ROW adjacent to Albany Pine Bush Preserve lands as described in Section 4.4.2 of the HCP and shown on Appendix C, Figure 13,

[3] The specific limits of this habitat type surrounding the wild blue lupine was not undertaken in the 2006 survey. The approximately 330 acres of potential buffer habitat (nectar and grass species) was estimated by factoring the average width of the ROWs (30 meters), the 200 meter linear distance surrounding the populations, the estimated

Voorheesville USGS 7.5' Quadrangle and further illustrated on HCP Appendix C, Figure 16. Section 4.4.2 of the HCP describes habitat restoration activities planned in this area. National Grid's obligations under this HCP for Covered Lands E are identified in Table 4.

Covered Lands – Enhancement: The following Covered Lands will provide habitat enhancement including vegetative management along ROWs with existing lupine, and infilling areas along the ROW with either wild blue lupine or nectar and grass species habitat to provide greater habitat connectivity along these ROWs.

Covered Lands D1 – Spier-Queensbury #17/5 115 kV ROW: As illustrated in Appendix C, Figure 17, this ROW runs north to south in the western portion of the Queensbury area between Upper Sherman Avenue and Morningside Circle, in the Town of Queensbury, Warren County. Covered Lands D is also illustrated on Appendix C, Figure 18. This ROW is approximately 12 acres in size; it is anticipated that approximately 6 acres of woody vegetative removal will be undertaken in this area. NG will modify existing vegetation management techniques within this ROW to create a grassland community that will favor the natural expansion of the wild blue lupine populations and other nectar plant species. The primary focus of Covered Lands D1 is the elimination of woody shrubs and low-growing trees, the associated vegetation layer that would otherwise shade-out wild blue lupine and nectar species to the point that they cannot survive. Periodic soil disturbances will also be carried out in conjunction with vegetation management activities. Undesirable plant species such as poison ivy, black locust, scrub oak, and non-native grasses that have become established in areas prone to yard waste dumping will also be removed, to increase the potential for wild blue lupine and other nectar plant growth. It should be noted that the enhanced vegetation management program will still be compatible with NG's continuing O&M program and NG's existing ROW access paths and structure work areas will also be maintained so that the covered activities can be continued without constraints. This effort is described in greater detail in Section 4.5.1 of this HCP.

Covered Lands D2 - Spier-Queensbury #17/5 115 kV ROW and Spier-Queensbury #5-Ogden Brook Tap 115 kV ROW: As illustrated in Appendix C, Figure 17, this ROW includes the Spier-Queensbury #17/5 115 kV ROW (see Covered Lands D-1 above) as well as the ROW that is located on the southern portion of this figure that runs from east to west between the Covered Lands C area (on the east end) and Covered Lands D1 (on the west end). The Spier-Queensbury #5 Ogden Brook Tap 115 kV ROW is also part of Covered Lands F - Restricting Illegal ROW Access. The effort associated with Covered Lands D2 is described in greater detail in Section 4.5.2 of this HCP. The focus of this effort is provide necessary grading and soil preparation and seed a native nectar species/grass seed/lupine mix at disturbance locations, ATV-damaged habitat and other open areas along these ROWs. This section of the HCP describes restoring approximately 25 acres of suitable habitat along these ROWs as an enhancement measure following successful cessation of ATV trespass (an additional enhancement measure). National Grid's obligations under this HCP for Covered Lands D are identified in Table 4.

Covered Lands – ROW for Survey: These ROWs segments, illustrated in blue in Appendix C, Figures 3 through 15, are where the 2006 Baseline Survey did not identify wild blue lupine habitat, but the potential still exists that Covered Species could be present. There are 56.1 miles of electric transmission line ROW, 52.9 miles of electric sub-transmission line, and 42.32 miles of gas lines located in ROWs[4] identified as Potential Covered Species with blue hatching on these figures. There are also 8.41 miles of

[4] Where multiple electric lines are located parallel in the same ROW, the length has only been counted once. Where a gas pipeline is located adjacent to an electric transmission line, both lengths have been counted.

distribution lines identified on the Verona Quadrangle illustrated as ROW for Survey. In these locations, NG will ensure that workers are alert and aware to the potential presence of wild blue lupine; if lupine is identified, AMMs will be utilized and the area of lupine noted. All ROWs hatched in red and blue on Figures 3 through 15 will be surveyed for wild blue lupine populations on a periodic basis. If, however, after two consecutive surveys (i.e., conducted every five years, so 10 years total), wild blue lupine continues to be absent on the blue hatched ROWs, there is the potential for some or all of these blue hatched ROWs to be removed from the areas of covered land as a minor amendment.

Covered Lands – Distribution Lines/Easements: National Grid operates and manages some electric and natural gas transmission lines and most of their distribution lines on lands that are accessed via easements[5]. Such easements are located within the GLARU, specifically, see Appendix C, Figure 2 which illustrates the geographic extent of this area. The USGS quadrangles where these Covered Lands may be located include: Glens Falls, Gansevoort, Saratoga Springs, Quaker Springs, Round Lake, Rotterdam Junction, Schenectady, Niskayuna, Troy North, Voorheesville, Albany, Delmar, Corinth (southeast corner), Fort Miller (southwest corner), Middle Grove (eastern edge), Schuylerville (northwest corner), Burnt Hills (eastern edge), Mechanicville (western 2/3rds), and Troy South (northwest corner).

As described in Section 1.1.3 of this HCP, the easements along transmission lines have generally been surveyed for wild blue lupine; easements along distribution lines have generally not been surveyed for wild blue lupine by the NYSDEC or by the entities that own and control them. While the specific locations of those distribution lines are known to NG, the locations of all wild blue lupine occurrences within such easement lands are not known, nor are there known maps illustrating the limits of the wild blue lupine in these areas.

Approximately 0.28 acre of wild blue lupine habitat was identified along some distribution ROWs that NG shares with other ROW owners and users (other municipal or private utilities). Since not all distribution line easements have been surveyed for wild blue lupine, it is assumed that an additional one acre of unidentified wild blue lupine populations could occur along unsurveyed distribution lines, in the Covered Lands. This additional one acre was estimated to account for potential incidental impacts to unidentified wild blue lupine populations within Covered Lands – Distribution Lines/Easements. Section 3.5 discusses methods used to identify potential take of Covered Species within the 1.28 acres of confirmed and unidentified wild blue lupine habitat within Covered Lands - Distribution Lines/Easements that could occur as a result of NG's O&M activities.

The main difference with this subset of Covered Lands compared to other subsets is that a) NG does not control all activities along these easements; the land owners and other potential easement users also operate and manage facilities within these locations; b) there may be locations of wild blue lupine along the distribution lines that have not been pre-surveyed or identified; and c) surveys of lupine and KBB/FE are not proposed to be performed by NG in the future along such distribution line easements.

For both Distribution and Transmission easements, NG generally has rights to perform the same types of facility O&M activities as are conducted on fee-owned ROW. An exception often involves public highway-related ROWs containing electric facility easements; in these locations, vegetation maintenance is generally limited to tree work (cutting, trimming/pruning and danger tree removals)

[5] Easements are lands, consisting mainly of public highway or road ROWs that are owned and controlled by others and where the easements may be shared with other ROW owners and users such as municipalities or private utilities.

while the vegetative floor of the public ROW is typically mowed by the public authority/municipality that owns and manages it. Where NG has underground natural gas pipelines in the public highway ROW, NG would conduct mowing if it's not undertaken by the public authority/municipality.

National Grid's obligations under this HCP specific to Covered Lands Distribution Lines/Easements are identified in Table 4. In general, it involves alertness and awareness training to the potential presence of wild blue lupine, and noting the presence should it be found. National Grid is not required to complete periodic surveys of distribution lines for wild blue lupine.

1.2.3 Occupied Habitat

For the purposes of this HCP, the USFWS, NYSDEC and NG consider all areas of wild blue lupine populations (Covered Lands A) and the 200 meter buffer zone (where it contains nectar or grass species; Covered Lands B) as "occupied habitat" by KBBs and FEs. The USFWS and NYSDEC consider the Covered Lands A and B to be occupied throughout the year due to the potential presence of various life forms (eggs, larvae, pupae, and adults) at various times of the year. The area extent of Covered Lands A and B is provided in Section 1.2.2, Covered Lands. It is noted that Covered Lands B habitat can include a variety of non-typical KBB/FE habitat.

Covered Lands C, D, and E, which involve on-ROW and off-ROW habitat restoration will be considered occupied habitat once wild blue lupine plants are established on those sites. Wild blue lupine areas established in these locations will be incorporated into Covered Lands A, as part of the survey process that is described below.

1.2.4 Survey Updates for Wild Blue Lupine and KBB/FE

As discussed above, in 2006 a baseline survey was completed to identify populations of wild blue lupine (and their limits).

The HCP proposes to replace this baseline survey data of wild blue lupine with periodic survey updates (every five years) to identify locations and area coverage of wild blue lupine on and within the NG electric and gas transmission ROWs (i.e., ROWs hatched in blue and red) and NG parcels as illustrated on Appendix C, Figures 3 to 15, within the following NY USGS quadrangles: Glens Falls, Gansevoort, Saratoga Springs, Quaker Springs, Round Lake, Rotterdam Junction, Schenectady, Niskayuna, Troy North, Voorheesville, Albany, Delmar, and Verona. The purpose of the periodic surveys is to identify where wild blue lupine populations have expanded or contracted in size. The survey will include updating the data based on any mitigation or enhancement activities undertaken by NG within strategically selected ROW areas (see Sections 4.4 and 4.5 of the HCP, which describes planting additional wild blue lupine on areas of NG ROW).

The survey will also identify whether any wild blue lupine populations decreased in size since the previous survey. Any areas identified as containing wild blue lupine habitat during these subsequent surveys will become part of Covered Lands A, and a 200-meter buffer around the lupine would become Covered Lands B. If the area is not already included in Covered Lands - ROWs with Covered Species (red hatching), they would be incorporated into this category of covered lands and appropriate AMMs identified in Section 4.3 will be applied in the future. As discussed above, if two subsequent surveys continue to demonstrate that there are areas of Covered Lands - ROWs for Survey (blue hatched ROWs)

that do not contain wild blue lupine, those areas may be considered for removal from the Covered Lands as a minor amendment. Survey protocol will follow the same protocol used in the 2006 Baseline Survey, see Appendix A.

Surveys of the Covered Species (i.e., presence/absence surveys) will be conducted every two years over Covered Lands A - Wild Blue Lupine Habitat, Covered Lands B – 200 meter Buffer Zone, and Covered Lands C, D, and E where wild blue lupine is present. The methodologies for the KBB and FE presence/absence surveys will be in accordance with the current USFWS and NYSDEC-accepted protocol for assessing KBB and FE populations. The current accepted protocol is the "Karner Blue Butterfly (*Lycaeides melissa samuelis*) Survey Protocols within the State of New York," prepared by the USFWS and NYSDEC, in May 2008.

1.3 Covered Species

Covered species are species that NG intends to conserve and protect through the implementation of this HCP. They are also the species that NG requests a permit for their incidental "take" from the NYSDEC and USFWS. As indicated above, these species are the Karner blue butterfly and frosted elfin.

Habitats of these endangered and threatened butterfly species are closely and uniquely associated with populations of wild blue lupine, a wild flower that generally favors open lands with sandy soils, little to no tree cover, and occasional soil disturbances (USFWS 2003). These two insects' life stages (i.e., egg, larval, pupal, and adult) are associated with the occurrence of wild blue lupine and other nectar plant species (USFWS 2003). In addition, nectar plants and grass cover in the vicinity (200 meters) of the wild blue lupine can also provide cover and food sources for adult species. This is discussed in more detail below.

1.3.1 Karner Blue Butterfly

The KBB was listed as an endangered species in New York State in 1977, and it was listed as an endangered species under the ESA on December 14, 1992. A recovery plan was prepared for the KBB in September 2003 (USFWS 2003). The KBB completes two broods, and subsequently, two adult flight periods. In typical years, first brood larvae hatch from overwintered eggs, in mid- to late April, and begin feeding on wild blue lupine, which is the only known larval food source. The larvae pupate in leaf litter, on stems and twigs, and occasionally on wild blue lupine leaves. First flight adults emerge from late May through late June. These adult females lay eggs primarily on wild blue lupine plants and occasionally on other plants or leaf litter, within close proximity to wild blue lupine plants. Second brood eggs hatch from early June to late July. The second flight adults emerge from early-July to early August. These adults lay eggs primarily on grasses and sedges, other plant species, and leaf litter near wild blue lupine stems and occasionally on wild blue lupine.

Adult KBB food sources include various plant species including common milkweed (*Asclepias syriaca*), butterfly weed (*Asclepias tuberosa*), horsemint (*Monarda punctata*), strawberry (*Fragaria virginiana*), hawkweed (*Hieracium* sp.), and cinquefoil (*Potentilla* sp.) (USFWS 2003). Additional life history can be found in the USFWS' 2003 Final KBB Recovery Plan. Wild blue lupine, the sole food source of KBB larvae, is a member of the pea family that flowers from mid-May to late June, in most conditions. Wild blue lupine is a species commonly found in the early stages of plant succession, as it is adapted to relatively dry and infertile soils. In the northeast, utility ROWs are often host to wild blue lupine populations, as it

is a species that thrives in open areas where periodic disturbance reduces canopy cover. Due to the uniquely close association that the KBB has with wild blue lupine and for the purpose and scope of this HCP, all wild blue lupine colonies will be regarded as occupied within the HCP Covered Lands.

1.3.2 Frosted Elfin

The FE is a globally rare species and it has a status of S1S3 in New York State (NatureServe 2007). In 1999, the FE was listed as a threatened species in New York. Frosted elfins are currently not federally listed under the ESA. In New York State, there are two species/subspecies of FE (NatureServe 2007). One of the species/subspecies feeds on wild blue lupine (flowers and leaves); the other feeds on wild indigo (*Baptisia* spp.). Wild blue lupine feeders occur in the GLARU, while wild indigo feeders primarily occur on Long Island. This HCP will focus only on wild blue lupine feeding FE.

The FE is univoltine (one generation per year). Adults typically start hatching from overwintered pupae in mid-April and they fly through early June. Similar to KBBs, adult females lay their eggs primarily on wild blue lupine plants and occasionally on other plants or leaf litter, within close proximity to wild blue lupine plants. The egg stage is short, with larvae typically starting to hatch in mid-June. Frosted elfin larvae feed on wild blue lupine flowers, developing pods, and leaves. The larvae pupate below the surface, in close proximity to wild blue lupine plants.

Suitable habitat requirements for FE are similar to that of KBBs. Conserving habitat for KBBs simultaneously conserves habitat for FE because both species are closely tied to their habitat and they both require wild blue lupine as a larval food source.

1.4 Environmental Settings

Geology: The GLARU portion of the Covered Lands is in the Hudson Valley section of the Hudson-Mohawk Lowlands and Adirondack Mountain physiographic provinces, while the Oneida RSPPRU portion of the Covered Lands spans the boundary between the Mohawk Valley section of the Hudson-Mohawk Lowlands and the Ontario Lowland physiographic provinces.

Soils: Soil horizons that have developed in the Covered Lands are generally sandy in nature with a glacial origin. The sandy soils are well-drained. Moisture levels within the sandy soils are generally low to moderate.

Climate: According to the Koppen-Geiger climate classification, the Covered Lands are located in a Warm Summer Continental climate zone. In the Oneida County portion of the Covered Lands, annual precipitation is approximately 46.3 inches and annual snowfall is approximately 153 inches. In the eastern portion of the Covered Lands (i.e., GLARU area), annual precipitation is approximately 38.6 inches and annual snowfall is 63.9 inches. Rainfall is spread fairly evenly over the year, and prevailing winds are generally from the west.

Existing Land Uses: The land uses adjacent to the Covered Lands are diverse due to the large size of the Covered Lands. Several portions consist of urban areas with a mix of commercial and high density residential developments, while other areas consist of suburban residential areas, agricultural fields, and undeveloped forested lands. The forested communities include Appalachian Oak-Pine Forest, northern hardwoods, successional northern hardwoods, and pitch pine scrub oak barrens (a globally rare

community), among others. A variety of wetland communities are also located in the vicinity of the Covered Lands and they include red maple hardwood swamp, sedge-meadow, shallow emergent marsh, and pine barrens vernal ponds (a globally rare community).

According to the USFWS and NYSDEC, several of the communities listed above, including successional northern hardwood forests, Appalachian oak-pine forest, and inland pitch pine- scrub oak barrens, are suitable for wild blue lupine restoration activities. In addition, other communities found within the Covered Lands that are suitable for wild blue lupine restoration and/or mitigation activities include oak-pine savannah, tall-grass prairie openings, successional old fields, successional southern hardwood forests, and mowed lawns with appropriate soils (Niver et al. 2010).

1.5 Regulatory Context

This HCP is being prepared in support of an ITP for NG activities that are anticipated to result in the incidental take of the KBB and FE. These activities will take place along electric and natural gas ROWs, some of which are fee-owned by NG and others that are easements within lands owned and controlled by others. This HCP will also include some NG non-ROW, fee-owned land parcels which are located adjacent to ROWs. NG work within ROWs that may result in the incidental take of KBB has been previously authorized under USFWS Enhancement Permit # TE813745-1.

1.5.1 Federal and State Laws and Regulations

National Grid is subject to compliance with all state and federal laws, including those related to natural resource protection and the ESA. Accordingly, NG activities fall within the purview of the USFWS, NYSDEC, and United States Army Corps of Engineers (USACE), among others.

A number of federal laws require protection of certain fish, terrestrial wildlife, and plant species and their habitat. Some sections of these laws overlap extensively with those of the ESA and they may directly or peripherally apply to this HCP. In addition to federal law, New York State has enacted legislation to protect species and habitats. Some of the most important Federal and New York state laws that provide species and habitat protection and the relevance of these laws to the HCP are summarized below.

1.5.1.1 Federal Endangered Species Act

Section 9 of the ESA, 16 U.S.C. §1538(a)(1)(B)and (C), prohibits the take of endangered species. Section 4 of the ESA defines a "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. § 1532[19]). "Harm" is defined in regulations promulgated by the USFWS as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR § 17.3 [2006]). "Harass" is defined by the USFWS as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (Id). "Incidental take" is defined by the USFWS as "any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (Id).

Pursuant to section 11(a) and (b) of the ESA, any person who knowingly violates Section 9 of the ESA or any permit, certificate, or regulation related to section 9, may be subject to civil penalties of up to $25,000 for each violation or criminal penalties up to $50,000 and/or imprisonment of up to one year.

Individuals and State and local agencies proposing an action that is expected to result in the take of federally listed species are encouraged to apply for an ITP under section 10(a)(1)(B) of the ESA to be in compliance with the law. Such permits are issued by the USFWS when take is not the intention of and is incidental to otherwise legal activities. An application for an ITP must be accompanied by a HCP. The regulatory standard under section 10(a)(1)(B) of the Act is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable. Under section 10(a)(1)(B) of the ESA, a proposed project also must not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and adequate funding for a plan to minimize and mitigate impacts must be ensured.

It was the intention of Congress for an HCP to also include candidate species, proposed species, or other species not listed under the ESA at the time of the HCP development in order to ensure the terms of the HCP will not change if these species are subsequently listed as endangered or threatened. Therefore, the FE is included in this HCP.

1.5.1.2 National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) requires federal agencies to include in their decision-making process appropriate and careful consideration of all environmental effects on a proposed action and of possible alternatives. Documentation of the environmental impact analysis and efforts to avoid or minimize the adverse effects of proposed actions must be made available for public notice and review. This analysis is documented in either an environmental assessment (EA) or an environmental impact statement (EIS). Project proponents must further demonstrate that their proposed action will not adversely affect the human or natural environment.

Issuance to NG of an ITP under ESA Section 10 constitutes a federal action that requires compliance with NEPA. To satisfy NEPA requirements, the USFWS will prepare an EA as part of its review.

1.5.1.3 New York State Environmental Quality Review Act

In New York State, all discretionary approvals (permits) from a NYS agency or unit of local government require an environmental impact assessment as prescribed by 6 NYCRR Part 617 State Environmental Quality Review (SEQR). The SEQR process requires the project proponent or approving governmental body to identify and mitigate the significant environmental impacts of the activity it is proposing or permitting.

The SEQR process requires the preparation of an environmental assessment form (EAF) to assess project related environmental impacts. If an action is determined not to have significant adverse environmental impacts, a determination of non-significance (Negative Declaration) is prepared. If an action is determined to have potentially significant adverse environmental impacts, a SEQR EIS is required.

The SEQR process uses the EIS to examine ways to avoid or reduce adverse environmental impacts related to a proposed action. This includes an analysis of all reasonable alternatives to the action.

1.5.1.4 New York State Environmental Conservation Law

According to ECL §11-0535, "Take" of a species listed as endangered or threatened is prohibited in the absence of a permit from the NYSDEC. As NG's activities have the potential to result in incidental take of the Covered Species, the NYSDEC will likely require a permit under ECL §11-0535. However, New York's incidental take policy is still in the process of development and the conditions and requirements of this policy have not been promulgated at this time.

1.5.1.5 National/State Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470) is designed to protect and preserve historic sites throughout the United States. Through the NHPA, each state is assigned a state historical preservation officer to oversee the program. Both the state and federal regulatory programs require a determination of effect letter from the State Office of Historic Preservation (SHPO) for potential impacts to historic areas. Consultation with the SHPO is mandatory for projects that involve federal or state permitting or involvement. National Grid will continue to consult with the SHPO per directives provided in their environmental guidance document, "EG-3067NY – Cultural, Historic and Other Natural Resources".

1.5.2 Regulatory Agencies

In addition to the regulations listed above, as a public utility, NG is also regulated by the state and federal agencies listed below.

- Department of Transportation (DOT) – The DOT Office of Pipeline Safety issues regulations addressing the construction, operation, and maintenance of all natural gas pipeline and compressor stations.
- Federal Energy Regulatory Commission (FERC) – FERC regulates bulk electrical sales and interstate transmission of electricity and natural gas.
- New York State Public Service Commission (NYPSC) – The NYPSC regulates utility rates and the siting/construction/maintenance of major electric and natural gas transmission facilities (Pursuant to Article VII of the Public Service Law).

1.6 Assurances Requested

1.6.1 No Surprises

The federal No Surprises Regulation was established by the Secretary of the Interior on March 25, 1998. It provides assurances to Section 10 permit holders, as long as the conservation plan is being properly implemented, that no additional money, commitments, or restrictions of land or water will be required should unforeseen circumstances requiring additional mitigation arise once the permit is in place. The No Surprises Regulation states that if a Permittee is properly implementing an HCP that has been approved by the USFWS and/or National Oceanic and Atmospheric Administration (NOAA) Fisheries, no additional commitment of resources, beyond that already specified in the plan, will be required.

The NG HCP documents minimization of impacts and provides compensation measures required under the HCP ("No Surprises") Assurances Rule (63 FR 8859) for incidental take of species covered in the plan, resulting from otherwise lawful activities. See also 50 CFR Sections 17.3, 17.229b)(5) and 17.32(b)(5), as explained more fully in 63 FR 8859.

No further mitigation or compensation will be required by the USFWS to address impacts on Covered Species caused by permitted activities undertaken by NG pursuant to the ESA.

2.0 COVERED ACTIVITIES

2.1 Introduction

National Grid's typical utility activities include O&M, reconstruction and new construction of electric transmission, sub-transmission and distribution structures, substations, as well as underground natural gas pipelines and associated aboveground gas regulator stations and valve sites. Maintenance and reconstruction activities include the replacement of structures and structural components that are deteriorated and nearing the ends of their useful service lives, or need upgrades due to load growth demands.

2.1.1 Environmental Guidance Documents

National Grid's typical utility activities are temporary in nature and involve localized and limited ground disturbances around affected structures or components. In order to avoid or minimize overall environmental impacts associated with its utility activities, the following Environmental Guidance (EG) documents provide standards and criteria for all NG work. Applicable NG EGs include:

- EG-301NY – Project Planning and Permitting
- EG-302NY – Protected Waters
- EG-303 - ROW Access, Maintenance and Construction Best Management Practices (BMPs)
- EG-304 – Migratory Birds
- EG-305NY – Rare and Endangered Species
- EG-3067NY – Cultural, Historic and Other Natural Resources
- EG-307NY – Herbicide and Pesticide Use
- EG-308NY – Unauthorized Dumping
- EG-501NY – Release Notification
- EG-502NY – Spill and Release Cleanup

All NG personnel and contractors are required to follow the above listed EG for protection of the environment.

2.1.2 Contractors

Contractors are required to follow the EG's listed above, and NG provides training to all contractors that work on their ROWs. As applicable to various work activities, contractors will receive a package of the appropriate EG documents above, including information on endangered species (such as KBB, FE and lupines if they will be working in these ROWs) prior to any work on NG ROWs. Contractors are held to the same performance standards in this regard as NG employees. This includes contractors and outside service providers brought onto a ROW as part of an emergency situation. As part of the briefing to respond to an emergency, NG will provide training regarding this HCP and will require contractors and outside workers to comply with this document.

2.1.3 Overview of Typical Activities

A component of maintenance is the routine and periodic inspection of these facilities, structures and ROWs. Periodic inspections may include aerial surveys, as well as vehicular access and/or foot traffic along ROWs. Vehicular or foot travel access is typically achieved along existing roads or cleared paths that traverse the ROWs. In some cases, access from adjacent lands, referred to as off-ROW access, is also utilized.

The need for maintenance activities can occur on an emergency, non-scheduled basis or on a routine, scheduled basis. Emergency maintenance activities can occur at any given time when an immediate danger to life, health, or the environment occurs. Examples of emergencies include but are not limited to: structural failure or damage caused by storm events (particularly from lightning strikes, fire, ice, wind and downed trees), motor vehicle accidents, and vandalism. Under the terms of the previous permit, the USFWS and NYSDEC were to be notified as soon as possible if emergency/non-scheduled work would be conducted in occupied KBB sites. The NYSDEC and NG worked together to develop site-specific procedures at that time, to avoid or minimize potential impacts to KBB, whenever possible. To eliminate the need for notifying the regulatory agencies prior to conducting emergency/non-scheduled activities and to prevent potential delays in emergency responses, NG has requested "Take" coverage for these types of activities.

National Grid's activities could result in an incidental take of the Covered Species, and as such include any otherwise lawful activity by any NG employee, contractor or agent required to safely and effectively operate and maintain its electric and natural gas transmission facilities and ROWs. National Grid believes that its careful conduct of its own activities, including vegetation management, has served to promote and protect habitats for these covered butterflies on affected ROWs. As part of the original USFWS permit, an eight-year study of vegetation management methods was performed and concluded that the vegetation maintenance methods traditionally employed do not adversely affect wild blue lupine populations, when applied at the appropriate seasonal timing (Forrester et al. 2005). Nevertheless, KBBs and FEs can still be impacted to varying degrees during vegetation management activities. Vegetation management, as presented in Appendix D, will continue to be implemented by NG in the affected ROWs. Section 2.2.5 discusses the Vegetation Management Plan in detail.

Routine, scheduled maintenance work on a given facility, in the Covered Lands, occurs intermittently, over the course of a year, depending upon the nature of the work, weather, work crew availability, and NG's ability to take a particular facility out-of-service, if needed, for the required duration of time. Typical equipment used in the maintenance of existing electric and natural gas infrastructure and ROWs consists of rubber-tired or track-mounted bucket trucks and aerial lifts, cranes, rubber-tired back-hoes and/or track-mounted excavators, rubber-tired or track-mounted drilling rigs with power augers, narrow-tracked bombardiers, pickup trucks, tractor or excavator-mounted mowers, and other specialized heavy equipment. Impacts associated with the presence and operation of these vehicles within the ROWs and along access roads are discussed in the following sections.

The generalized utility activities typically performed by NG personnel or contractors are described below and are categorized according to existing disturbances and new construction activities.

2.2 Existing Activities

Existing activities within the Covered Lands include typical O&M activities such as facility and access road repairs, substation upgrades and repairs, and management of vegetation within the ROWs.

2.2.1 Electric Transmission, Sub-transmission, and Distribution O&M Activities

National Grid's O&M on its electric transmission facilities is strongly dependent upon coordination with New York Independent System Operator (NYISO) in regards to scheduling outages necessary for system maintenance and system-wide prioritizing of projects, based on improvements needed to ensure reliable delivery of electricity to customers. The following is a representative listing of typical O&M activities undertaken on electric transmission, sub-transmission and distribution facilities and associated ROWs:

Establishing safe work/staging areas: Working on electrical facilities inherently requires that NG perform O&M activities under safe working conditions. In order to provide safe and stable work and staging areas for the necessary equipment and personnel, some grading and/or placement of temporary mats may be needed around structures, where slope and/or soil conditions would not safely support the operation of machinery. The size of the transmission or sub-transmission line structures and associated construction equipment primarily dictates the typical size of the work/staging areas. Transmission and Sub-Transmission lines within the Covered Lands can range from 34.5kV to 230kV. At the larger end (230kV) of the transmission lines located in the surveyed ROWs, an approximately 7,200 square feet (60 feet wide by 120 feet long) area may be needed, while a 1,000 square feet (20 feet wide by 50 feet long) area may suffice for smaller size (34.5kV) transmission lines. Staging areas are typically contained within the ROWs and are located near the existing structures.

Replacement of wooden poles or other structures: Wooden poles typically last greater than 40 years. However, they occasionally need to be replaced sooner due to decay, structural inadequacy, age, insect infestation, woodpecker or other damage. The replacement pole or structure is typically installed adjacent to the existing pole or structure, or in the same pole hole location; cross-arms and other components are installed on the replacement pole or structure; conductors are transferred to the new pole or cross-arm; and the existing pole or structure is removed and disposed of off-site, at an approved NG disposal facility. Depending upon site conditions and restrictions, removed poles or other structural materials are hauled off of the ROW by carrying them on mechanized equipment or dragging them to a pick-up site, if environmentally acceptable (if not posing a soil erosion or vegetation damage concern). Following removal of the poles, the hole is backfilled to grade around the new pole or structure with soil stockpiled during excavation, and the disturbed site is typically seeded and mulched to stabilize the soil, following work completion.

Suitable backfill such as ¾-inch stone may be transported from off-site to secure structures located in ledge or other landform types requiring supplemental backfilling. If needed, fast-germinating grass seed may be used to stabilize ground disturbances in upland areas. The replacement of sub-transmission and distribution wood pole structures typically results in an average temporary ground/soil disturbance area of 100 square feet around each pole, with larger transmission poles or structures (for 115kV and greater voltages) requiring a larger work area of up to 6,000 square feet (50 feet wide by 120 feet long) or more around each structure. Installation of steel poles and towers often includes installation of caisson foundations, as necessary. The typical duration of work to replace sub-transmission and distribution

pole structures is a few hours and several poles can often be replaced in the above manner, in one day. Replacement of larger transmission (115kV and above) poles/structures can take up to several days to complete, per structure.

Replacement of cross-arms, cross-braces, insulators, and other structural components: The replacement of these structural components is typically conducted from bucket trucks or cranes. Rubber-tired equipment is typically used; however, flex-tracked or low load bearing equipment is used to minimize rutting and soil disturbance at sensitive areas (wetlands, protected habitats, areas with erodible soils). Typically, some temporary ground disturbance occurs from equipment accessing structures, along the ROW. The typical time per structure is minimal and numerous structural components can be replaced in one work day.

Replacement of pole guys and anchors: The replacement of anchors typically results in an average temporary ground disturbance of approximately 100 square feet per anchor (10 ft. x 10 ft.). Where applicable and site conditions are favorable, low impact anchors such as screw anchors or Manta Ray anchors are used in lieu of plank anchors. Depending upon the type of anchor required to secure the pole structure and the number of anchors required for the structure, the anchor may be installed through excavation, drilling, or by pneumatic hammer.

Suitable backfill such as ¾-inch stone may be transported from off-site to secure structures located in ledge or other landform type requiring supplemental backfilling. As with pole replacements, soil surrounding the installation is restored to grade, mulched and allowed to naturally re-vegetate (unless seeding is deemed necessary). The time per structure is minimal and numerous anchors can be replaced in one work day. Typically, guys and anchors last in excess of 30 years.

Grounding improvements and replenishment (grounding line, wire trenched in, etc.): The refurbishment or enhancement of the grounding system is required to maintain the system in operation. Grounding improvements may involve shallow trenching/excavation to a depth of up to 18 inches to install/replace ground wires or other components of the grounding system. The typical disturbance area associated with this activity is associated with use of a mechanized ditch witch trenching machine or hand-digging along a narrow path, for the site-specific distance. Therefore, the actual amount of soil disturbance is minimal.

Reconductoring/Thermal upgrades: This activity is typically conducted to serve increased load or to replace deteriorated conductors. Reconductoring is replacing existing conductors of lines with new conductors that are at the same voltage and is required to enhance the reliability of the existing electric grid and to reduce the line's vulnerability to thermal overload during certain high electrical load periods. At times, reconductoring projects may also include the replacement of insulators, hardware and shield wires, as well as the replacement of poles, cross-arms, guys and anchors, or taller poles.

Reconductoring is typically conducted using bucket trucks or cranes and specialized wire stringing equipment (mechanized cable reels on trailers) and ground disturbances are typically limited to equipment access along the ROW. This work may take several weeks to several months, for the overall line. Work in any one location may be limited to a few days or could continue periodically over several weeks or months, depending upon the project scope.

Thermal upgrades are occasionally performed to increase power transfer capability of existing lines. Options for thermal upgrades include installation of taller structures or increasing wire tension. The typical disturbance area associated with thermal upgrades is limited to a small area at the base of structures.

Steel pole/steel lattice tower foundation inspections and repairs: These periodic inspections require shallow excavation of the pole or tower legs. Excavations are typically dug by hand, however, depending on the structure, some below-ground inspections are conducted using machinery. The inspections are brief, with limited and localized disturbance. Typically, two to three square feet of land is disturbed during the inspections. Several poles/towers can typically be inspected within one work day. Repairs can take one or more days to complete, depending on severity.

Wooden pole inspections, treatments, and repairs: These activities are typically conducted to reduce or control insect or woodpecker damage and/or wood decay to extend pole life. Periodic inspections require shallow excavation of the pole. Pole treatments are localized and are based on the inspection/condition of the wood pole. The inspections are brief, with limited and localized disturbance, and several poles can typically be inspected within one work day. Typically, 25 square feet (5 ft. x 5 ft.) of land is disturbed during the inspections. Products typically used to treat the poles include COP-R-Plastic Wood Preserving Compound, Hollow Heart CF, MITC-FUME, and Demon-Max. Repairs can take one or more days to complete, depending on severity.

Painting of steel poles and towers: Old paint on the steel poles and towers is scraped and sanded and then the towers are painted using a non-lead based paint, on a periodic basis. Bucket/boom trucks are often used to paint structures. The paint encapsulates the bare steel or prior coating and protects the steel from degradation. Only a small area at the base of structures is typically disturbed by this activity.

2.2.2 Electric Substation O&M Activities

Some maintenance activities are completed within and just outside of existing fenced substations that connect to ROWs, where potential KBB habitats could occur. Within the Covered Lands, only one substation, the Ogden Brook Substation (Town of Queensbury, Warren County), is located in close vicinity to wild blue lupine populations. Substations are fenced and consist of a gravel substrate. Herbicides are applied within and just outside of the fenced area; therefore, herbaceous vegetation (i.e., wild blue lupine) is not allowed to grow within the substations. The following is a representative listing of typical O&M activities undertaken at substation facilities:

Substation Maintenance: This activity typically involves localized ground disturbance and is temporary in nature. The disturbed area is restored to grade. This activity may include replacement of above-ground structures including but not limited to electrical equipment, light fixtures, and perimeter fencing; replenishment of crushed stone base and SPCC (spill containment) berm within the existing footprint of the substation; repair of underground infrastructure; and vegetative management (herbicidal application). The disturbance area for this activity is the existing footprint of the substation.

Substation Upgrade and Expansion: This activity involves work typically conducted outside of the existing footprint of the substation. This may involve reconditioning or repaving the access driveway to the substation, which results in little to no ground disturbance and no new impervious surfaces are typically created as a result; replacement of buried cable, duct banks or other below-grade

infrastructure which usually involves the installation of new infrastructure within or adjacent to the existing alignment; and expansion of the fenced area which may involve grading and spreading crushed stone or seeding and mulching. Herbicides may also be applied in the expansion area. Unlike herbicide use within ROWs, herbicides may be directed at both herbaceous and woody vegetation in the substation expansion areas. These applications are typically limited and extremely localized.

2.2.3 Natural Gas Pipeline and Associated Facilities O&M Activities

National Grid's typical natural gas pipeline and associated facilities maintenance activities include pipeline inspections, repairs and remediation of pipeline exposures, and pipeline replacements (same size or larger). Extensive repairs or remediation of large exposure areas are possible, but not common. When maintenance is required, soil excavation and disturbance is usually necessary.

Pipeline maintenance may include but is not limited to valve replacement and pipeline replacement, in sections or in total. Typical equipment used includes large tracked excavators, compressors, mechanized booms/cranes, 10-wheel dump trucks, backhoes and pick-up trucks. The following O&M activities are further described, as follows:

Pipeline integrity inspections (including cathodic protection): During this activity about 10 feet of pipeline is typically exposed, using the existing ROW for access and work activities. However, 20-30 feet of exposure may be required during some integrity inspections. The minimum width of trench is typically at least twice the nominal diameter of the pipe. The excavated soils are typically placed on the ROW, adjacent to the work area, and then used as backfill after completion of the required work. It is common to encounter water in excavations and such water is typically pumped/removed and managed in a controlled manner within the ROW (via use of silt-fencing, straw bales, etc.) to prevent discharges to surface waters and erosion. Temporary clearing of vegetation along the ROW is usually not needed. Pipeline integrity inspections and minor repairs are typically completed within a few days to a week.

This activity may also involve the periodic installation of galvanic anode beds, to maintain cathodic protection of the gas pipeline. Intermittent and small excavations are required to make these installations, similar to the excavations needed for integrity inspections.

Pipeline exposure remediation: This activity involves placement of new backfill and cover materials, the extent of which depends upon the severity of the exposure. The majority of this work occurs in sandy soil areas where unauthorized vehicular use has caused erosion of pipeline cover or at stream crossings.

Pipeline Removal and Abandonment: During this activity, non-coal tar wrapped pipelines may be left in place and only temporary impacts such as minor ground disturbances are typical. It is NG's policy to remove coal-tar wrapped pipe. This activity involves excavating the pipe and removing it from the ROW.

Pipeline Replacement: This activity involves the replacement of pipelines within the existing ROW. The pipelines being replaced are the same size or larger than the existing pipelines. Excavations are required for these replacements, and regrading of the area to the existing conditions are also required.

Hydrostatic Testing: Hydrostatic testing is usually conducted in conjunction with pipeline replacements. During this activity, water withdrawal/discharge may occur in the immediate vicinity of the pipeline, in a controlled manner that includes use of appropriate erosion controls.

Pipeline Small/Miscellaneous Maintenance: This activity is typically associated with the replacement of aboveground pipeline equipment and meter checks. This activity may consist of NG employees walking over the buried pipelines and using hand-held equipment to replace or check the pipeline equipment. Minor, temporary ground disturbance may occur during this activity.

Scheduled inspections: This inspection technique requires the routine clearing and maintaining of vegetation along the ROWs to allow leak surveys. Mechanical techniques of maintaining vegetation are generally conducted on two or three year cycles and chemical treatment is generally conducted on five to seven year cycles. The actual leak surveys are completed on an annual and five-year basis. They consist of employees walking over the buried pipeline, using hand-held equipment to detect pipeline leaks.

2.2.4 General ROW Maintenance Activities (Electric and Natural Gas)

The following O&M activities are representative of typical, non-project-specific activities conducted annually by NG at various locations along its ROWs:

Removal of Debris, Trash, and other unauthorized use: Debris and trash from unauthorized trespass and dumping are removed from ROWs and other NG properties, as practicable. It is assumed that hazardous waste is not included as debris. Sheds and swimming pools placed within the ROWs by adjacent landowners are also not allowed by NG. National Grid's Security Department often works with local law enforcement agencies in efforts to have such materials removed from its properties. Depending upon the types of materials encountered, typical equipment used to accomplish the removals may consist of a rubber-tired backhoe and dump truck. This equipment uses existing ROW access roads or paths, as practical, to access debris and disposal sites.

Access Control Measure Installation: Gates or boulders on ROWs or other access points are repaired, replaced or installed, as needed, due to deterioration, vandalism or trespass situations. Duration of the repair, replacement or installation and whether ground disturbance is associated with the work (such as for posts) depends on the condition of the existing gate and may range from a few hours to one or more days in duration. Typically, less than 10 to 20 square feet of land is disturbed when gates or boulders are installed.

Granting of ROW Uses: This activity typically involves granting the placement of driveways and temporary or permanent roads within the ROWs for use by adjacent landowners. Temporary roads may be constructed by landowners attempting to gain access to adjacent parcels for various purposes (i.e., logging), and permanent roads and driveways are typically associated with residential subdivisions that are constructed in the vicinity of the ROWs. An AMM for this activity is described in Section 4.3.2(s).

Security inspections and enforcement actions: National Grid Security Department and/or local law enforcement agency personnel periodically perform inspections of ROWs and of other company properties. As needed, they also conduct investigations and enforcement activities to stop illegal trespass and unauthorized use of these properties. These periodic security activities sometimes require vehicular traffic along the ROW (via pick-up trucks, ATVs, etc.). These activities entail little to no ground disturbance along the ROW and such disturbances are primarily limited to that caused by temporary vehicle access. Access is achieved via existing access roads or paths, where possible.

National Grid's Security Department and many local law enforcement agencies believe that legislation is needed to strengthen the penalties for illegal trespass and unauthorized uses, particularly by ATV operators. They believe that impoundment/seizure of ATVs should be allowed to help deter such illegal actions and associated damages to ROWs.

2.2.5 Vegetation Management/Maintenance Activities (Electric and Natural Gas)

As provided by NG's *Transmission Right-of-Way Management Program (October 1989, Revised May 2010)* (see Appendix D), NG's strategic approach to vegetation management within the ROWs is to establish and maintain ROWs that are largely clear of all incompatible vegetation, while maintaining a stable, low-growing plant community that is pleasing to the eye and beneficial to wildlife.

Incompatible vegetation are those species of vegetation, trees and certain tall-growing shrubs that have mature height great enough to grow within the Minimum Clearance Distances to be maintained under all rated electrical operating conditions. National Grid's strategic approach to manage vegetation adjacent to the ROW is to prune and/or remove danger trees and/or hazard trees where property rights allow vegetation management work, and to encourage the growth of low growing vegetation. These danger trees may be located off of but adjacent to NG's ROW.

ROWs that are largely clear of incompatible vegetation present a very low risk of vegetation-caused outages. Vegetation adjacent to ROWs (danger and hazard trees) presents a greater risk of outages. The risk from danger trees and hazard trees is related to the following variables: the distance from conductor to the adjacent tree line, conductor distance above ground, height of trees, tree species, and tree health and condition. National Grid seeks to mitigate risk of outages from trees adjacent to the ROW through site-specific management of these variables.

Vegetation management work on electric transmission, sub-transmission and distribution ROWs is organized into two programs:

- Right-of-Way Floor Program – management of vegetation within the ROW corridor
- Off Right-of-Way Danger Tree Program – management of vegetation adjacent to the ROW corridor

To achieve its vegetation management objectives, NG utilizes an Integrated Vegetation Management (IVM) approach which emphasizes selective herbicide use to control incompatible vegetation. IVM integrates the use of various methods of herbicide applications and non-herbicide mechanical vegetation management methods. This integrated approach is used both on the ROW floor and the adjacent forest. The IVM program includes the use of herbicide supplied as basal application, stump application and foliar application, hand cutting, mowing, selective mowing and selective pruning methods.

When chemical controls become necessary to control and prevent the growth of undesirable, tall-growing woody species, NG is committed to employing selective, targeted applications. These treatments shall use approved herbicide products and mixtures that target specific plants or plant communities in a manner calculated to control and eliminate the tall-growing, undesirable woody species, while preserving as much of the small, compatible woody shrub and herbaceous vegetation, as practicable. A list of herbicide products and application methods and timing are presented in NG's *Transmission Right-of-Way Management Program (October 1989, Revised May 2010)* (see Appendix D).

National Grid's general policy-related vegetation maintenance cycles for all ROWs are as follows:

- Right-of-Way Floor Program – four to eight years
- Off Right-of-Way Danger Tree Program – eight to sixteen years (note that certain ROWs are wide enough that Danger Tree work is never necessary)

National Grid's Forestry staff is responsible for inspection of vegetation conditions on ROWs. Inspections are carried out for several purposes including, but not limited to: determination of treatment efficacy of herbicide floor work following work completion by contractors; evaluation of efficacy of floor maintenance cycle length; planning danger tree work and patrolling the transmission system to find vegetation conditions that are an imminent threat to the reliability of the electric system. Inspections consist of periodic ground and aerial helicopter patrols, the timing of which depend upon the applicable line voltage and associated ROW maintenance cycles.

Appropriately certified and qualified contractors are retained to carry out nearly all hands-on vegetation management work on NG ROWs. Additional information on contractor qualifications, herbicide mixes and definitions/descriptions of IVM methods is provided in NG's *Transmission Right-of-Way Management Program (October 1989, Revised May 2010)* (see Appendix D).

Vegetation maintenance on NG's natural gas pipeline ROWs is done to achieve the following:

- Facilitate annual and five year corrosion surveys;
- Provide access for emergency and routine repairs;
- Provide access for routine line patrols;
- Identify ROW boundary markers and associated gas pipeline equipment; and
- Note incompatible uses of the gas pipeline ROW.

Mechanical and chemical techniques are employed that control woody shrub and tree growth and retain or enhance indigenous herbs, grasses and forbs. Mechanical treatments are generally conducted on two or three year cycles. Therefore, it is anticipated that during the coverage of the ITP, approximately 25 mowing/trimming events or more will be necessary on gas pipeline ROWs. Chemical treatment is generally conducted on five to seven year cycles. The cycle depends on the effectiveness of the initial application and rate of regeneration of seedlings. All treatments are confined within the easement or ownership boundaries of the gas pipeline ROW. It is anticipated that approximately 10 chemical treatments will be necessary on Natural Gas ROWs during the life of the ITP.

Trimming (Mechanized Mowing and Cutting): This activity is conducted along the ROW to access structure sites and to provide safe work areas around structures. A reasonable cleared width or path is usually created around pole or structure sites to provide a safe work environment for access to the work location. Typically, up to 15-feet wide access road widths would be established by mowing/trimming existing vegetation. Most of the access roads consist of unimproved, earthen access paths. In general, a cleared radius of 50 feet would be established by mowing/trimming around structures, if conditions warrant. Mowing and trimming also may be conducted along the ROW for live (energized) line work or for conductor stringing equipment set-up. Mechanized mowing involves the use of commercial sized mowers (tractors or ATVs pulling mowers) and mechanized trimming/cutting typically involves the use of a hydro-axe to cut the vegetation.

Tree Clearing: This activity involves the clearing of trees with hand-held equipment (chainsaw). Trees are cut close to the ground and the stumps that are left do not exceed 3 inches in height. Temporary ground disturbance typically may result from this activity.

Herbicidal Application (handheld and vehicle applications): The majority of the handling, mixing, and loading of herbicides is conducted outside of the ROWs. No mixing is allowed within 100 feet of any sensitive areas. National Grid employs four methods for applying herbicides: basal application, cut stump application, and low-volume and high-volume foliar applications. Please see Appendix D for a detailed description of the application procedures.

Vegetation Disposal: Please see Appendix D, for a detailed description of this activity. The equipment typically utilized for this activity is listed below.

- *Collect and Pile:* This activity typically involves the use of backhoes, bulldozers, or skidders to push or pick-up and pile logs and large slash.
- *Chipping and Hauling:* This activity typically involves the use of a chipper to grind the wood products and a box truck to haul the chipped material off-site.
- *Chipping and Leaving:* This activity typically involves the use of a chipper to grind the wood products, which are left in place at the chipping site.
- *Hauling (staging areas):* This activity typically involves the use of a logging-type truck to haul large trees and debris.
- *Drop and Lop:* This activity typically involves the use of chainsaws to cut the trees down (drop) the tree and cut the fallen tree into small pieces (lop).

Off-ROW Danger Tree Removal: Off-ROW trees that are generally trimmed include trees that are tall enough and close enough to electric conductors that they may be capable of growing or falling into the lines. Trees are typically removed by the use of chainsaws. This activity does not typically occur within the ROW corridor. As this activity typically occurs every 8-16 years, approximately six off-ROW danger tree removal events will be necessary over the life of the permit.

2.2.6 ROW Repair, Regrading, and Revegetation (Electric and Natural Gas)

Hand Repair: For minor disturbances to the ROWs, hand held equipment can be used to repair the disturbed areas. This activity typically involves the use of hand held equipment such as shovels and rakes for repair disturbances and the spreading of native seed mixes for revegetation.

Mechanical Repair: Depending on the amount and type of repairs needed to the ROW, mechanical equipment may be necessary. Typically, a backhoe or bulldozers are used to mechanically repair the areas. After disturbances are repaired, appropriate seeding mixes are applied.

2.2.7 Access Road O&M Activities

Existing Access Road Maintenance and Repair: Maintenance and repair of ROW access roads may be required to facilitate continued equipment access. Work may include some minor improvements to existing access roads and access paths/routes within and adjacent to the ROW, in order to provide safe ingress and egress to/from the ROW for the necessary construction equipment. Work activities may

involve minor grading of eroded areas, filling of ruts with crushed stone or gravel, or "back-blading" the surface of the access road.

For maintenance projects, work typically does not involve expansion of the existing footprint of any original access fill or an increase in the elevation of the road crossing. It is NG's typical/standard practice to install suitable crushed stone aprons/ramps at public road entrances intersecting the ROW to avoid and/or minimize tracking of soil/mud onto the paved surfaces. During winter months, it is sometimes necessary and useful to construct temporary snow/frozen access roads to reach structures located within rugged terrain or wet areas. Snow/frozen access roads are constructed by waiting for the ground to freeze, and then compacting subsequent snowfalls with mechanized equipment.

Replacement of damaged culverts is typically conducted in-kind and during low flow conditions, if possible. Sediment and erosion controls are employed as needed to ensure the prevention of down-gradient sediment migration. The duration of the replacement activity depends on site conditions and may range from a few hours to several days.

Snow Plowing: During storm events or when access is needed to ROWs that are snow covered, there may be the need to snow plow within the boundaries of the access roads. Typically a backhoe, bulldozer, or pickup truck with a plow is used to plow the snow. Ground disturbances outside of the access road footprint do not typically result from this activity; however, if snow is plowed outside of the footprint of the access road, disturbances may occur to habitat for the Covered Species.

2.2.8 Facility Inspection Activities

Helicopter Inspections of ROWs: Aerial inspections of the ROWs are conducted annually for 230kV ROWs and once every two years for 115kV ROWs. No ground disturbance along the ROWs results from this activity.

2.3 New Activities

Over the duration of the ITP, NG will periodically rebuild and refurbish its existing electric and natural gas infrastructure in the Covered Lands. New electric and natural gas facilities will be occasionally installed and constructed in the Covered Lands as needed to support effective and reliable energy delivery to NG customers, over the duration of the ITP. Activities associated with construction of any new features are summarized and discussed below. National Grid is requesting take coverage for these new construction activities within the covered lands. Any new construction activities by NG located outside of the Covered Lands that may affect KBB/FE habitat will not be covered under this HCP, and should such a situation arise, an amendment to the HCP/ITP will be required.

2.3.1 Land Clearing

Hand Tree Clearing: This activity involves the clearing of trees with hand-held equipment (chainsaw). Trees are cut close to the ground and the stumps that are left do not exceed 3 inches in height. Temporary ground disturbance typically may result from this activity.

Mechanized Tree and Shrub Clearing: During the clearing of a forested tract of land, mechanized equipment may be necessary to remove trees and shrubs. Equipment used to remove this vegetation typically includes hydroaxes.

Herbaceous Clearing: This activity involves either application of herbicides or mechanized mowing equipment.

Stump Pulling and Removal: This activity involves the use of a bulldozer or backhoe to pull and remove stumps from the ground. Ground disturbances typically result from this activity.

2.3.2 Vegetation Disposal

For a description of the vegetation disposal activities, please see the activities described under the Vegetation Disposal heading in Section 2.2.5, Vegetation Management/Maintenance Activities (Electric and Natural Gas).

2.3.3 Earthwork

Grading: This activity involves the use of either mechanized equipment (i.e., backhoe, bulldozer, etc.) for larger grading activities or handheld equipment (i.e., rakes, shovels, etc.) for smaller sites.

Installation of Erosion Control Devices: Erosion control devices (i.e., silt fences, hay bales, catch basins, etc.) are employed as needed to ensure the prevention of down-gradient sediment migration. This activity typically involves the use of mechanized equipment and ground disturbances typically occur.

Trenching/Digging: This activity is associated with utility installations and it involves the use of a backhoe to excavate the installation area.

2.3.4 Access Road Construction

Temporary Access Roads: This activity involves the use of mats or gravel on geotextile fabric (to be removed). Temporary ground disturbances are associated with this activity.

Permanent Access Roads: This activity involves the installation of gravel on fabric, with drainage and erosion control devices (i.e., culverts, water bars, etc.). Blacktop pavement may be applied in some areas.

2.3.5 Electrical and Natural Gas Facility Installation

Padding and Backfilling: This activity is involved with the installation of gas pipelines and/or underground electric cable. During this activity, a layer of sand (padding) is placed on the bottom of a trench, to cushion/protect the pipeline or cable, and then the trench is backfilled.

Structure or Facility Installation: This activity involves the fabrication, erection and/or installation of structures and appurtenant parts and materials, including conductors, wires, guys, anchors, insulators, pipelines, valves, etc.

Hydrostatic Testing: A description of this activity is provided above in Section 2.2.3. This activity will only be necessary when new pipelines are constructed or for pipeline replacements.

2.3.6 Regrading, Stabilization, and Restoration

Regrading, disking, seeding, mulching, and landscaping: This activity involves the use of bulldozers and/or ATVs with plows, mulching and seeding equipment.

Fertilizer Application: This activity also involves the use of tractors and/or ATVs with plows, mulching and seeding equipment to apply fertilizer to impacted areas.

2.3.7 Spill Occurrence, Prevention, Containment, and Control

Spill Event: This activity is typically associated with the accidental or incidental release of hydraulic fluids, oils, or fuels from mechanized equipment.

Spill Clean-up: This activity typically involves the use of backhoes, bulldozers, and trucks to perform soil excavations, disposal, and site restoration.

3.0 IMPACT ANALYSIS METHODOLOGY

The potential for temporary and/or permanent habitat disturbance and direct killing of KBBs and FEs are the primary anticipated impacts of NG's covered activities. This section includes a description of the approach used to estimate habitat disturbance for the Covered Species, as a result of NG's covered activities, and an estimate of the amount of such disturbance. These estimates resulted in the development of the AMMs and restoration/mitigation described in Chapter 4, Conservation Strategy.

3.1 Analysis of Habitat Disturbance Acreage

For this HCP, estimating activity effects entailed four steps:

- Delineate known KBB and FE habitat on NG Lands. This was accomplished by utilizing data from the 2006 Baseline Survey of the ROWs and 2007 NYSDEC maps of known wild blue lupine habitat to develop a map of Covered Lands (see Section 1.2, Covered Lands and Subsets);
- Evaluate the covered activities (see Chapter 2, Covered Activities);
- Evaluate the activities to determine if they have the potential for direct and indirect impacts on the Covered Species and their associated habitat; and
- Develop estimates of acreage disturbed for all covered activities.

The following is a description of this four-step process of estimating effects from NG's activities upon the Covered Species and/or their habitats.

3.2 Delineation of KBB and FE Habitat

Geographic Information Systems datasets depicting the location of wild blue lupine populations surveyed along NG's electric and gas ROWs during the 2006 Baseline Survey were reviewed by NG to determine areas where impacts could potentially occur to the Covered Species and their associated habitat. Aerial maps showing the location of transmission structures (i.e., wooden poles, steel towers, etc.) and access roads were essential to the analysis of potential impacts. A detailed description of how the boundaries of the wild blue lupine populations were delineated is provided in Section 1.1.3, 2006 Baseline Survey of Wild Blue Lupine Habitat.

As discussed in Section 1.2.4, the HCP proposes to replace this 2006 baseline survey data of wild blue lupine with periodic updates (every five years) to identify locations within the Covered Lands (excluding Covered Lands-Distribution Lines/Easements) where wild blue lupine populations have expanded or contracted in size. The updated survey information, including specific areas and boundaries of the wild blue lupine within the Covered Lands and its impact on the subcategories of Covered Lands would then be added to the HCP. Discussion of whether an amendment is needed for new information is discussed in Sections 5.5.1 and 5.5.2. National Grid's proposed future activities within the Covered Lands should be checked against the most current survey data to determine the areas subject to AMMs.

3.3 Evaluation of Covered Activities

National Grid's natural gas and electric transmission managers were contacted in an effort to identify all of NG's activities along their wild blue lupine-occupied ROWs that could result in "incidental take" of KBB/FE. The managers provided a list and briefly described all O&M, inspection, testing, vegetative management, construction, emergency response, security/access controls and other activities that could be conducted along ROWs with wild blue lupine populations. Descriptions of these activities are provided in Chapter 2, Covered Activities. These descriptions enabled NG to assess the extent of potential impacts to the wild blue lupine populations identified during the Baseline Survey, and to estimate the amount of mitigation needed to compensate for potential negative direct and indirect effects to the Covered Species.

3.4 Evaluation of Disturbance Events

To determine the extent of disturbances to the Covered Species as a result of NG's covered activities, an impact assessment matrix was developed. The matrix listed all of NG's covered activities and the types of potential impacts (direct vs. indirect and permanent vs. temporary) that may occur to the Covered Species as a result of these activities. For the purposes of this HCP, direct impacts are defined as impacts associated with covered activities that result in the mortality of the Covered Species.

Examples of direct impacts include vehicular collisions with individual butterflies, lethal exposure of adults, pupae or larvae to toxic materials (e.g., herbicides, pesticides, paint, etc.) used by NG during routine O&M activities, and crushing or burying of individuals associated with permanent or temporary occupied habitat disturbance. Indirect impacts include those that could affect the Covered Species later in time and include fragmentation of wild blue lupine/nectar habitat, and the permanent and temporary loss of wild blue lupine and nectar plants. Permanent impacts cause functional loss of habitat that can no longer be used by butterflies. In other words, permanent impacts are defined as impacts that remove or kill the plants. Temporary impacts do not result in permanent habitat removal.

Aside from NG's activities, illegal ATV usage within the ROWs may also lead to both direct and indirect effects on the Covered Species. In some areas, illegal ATV usage of affected ROWs poses the greatest potential threat to the habitats that occur within those ROWs. A list of ROWs and associated wild blue lupine populations that are at the greatest risk from ATV usage is presented in Table 2. These locations are Covered Lands F and are illustrated on Figure 20, Restriction of Illegal ROW Trespass.

Table 2: ROWs at Greatest Risk from Illegal ATV Usage

ROW	NG Transmission Structure (e.g., Pole Numbers)	Affected Wild Blue Lupine Populations
Spier-Queensbury #17/5 (Also location of Covered Lands D1 and D2)	#17: 725-731 #5: 621-627	GF63a-63d; GF64a; GF64b; OPA-GF02
Spier-Queensbury #5-Ogden Brook Sub Tap (Also location of Covered Lands D2 and C)	1-17	GF59-62; NGP GF01-05; GF60b; GF60c; GF63e; OPA GF04-GF09
Queensbury-Henry Street #14	52-60	Provides access to populations listed above.

3.4.1 Potential Direct Impacts

Permanent impacts may be caused by the presence and operation of vehicles within the ROWs, grading disturbances associated with electrical facility O&M activities, natural gas pipeline O&M activities (pipeline inspections and replacement), general ROW activities (debris removal, barrier installations/repairs, etc.) and vegetation management activities (herbicide application, vegetation disposal, etc.). Temporary occupied habitat disturbances may be caused by activities such as steel pole/lattice tower and wooden pole inspections, mechanical mowing, off-ROW danger tree removal, hand repair (with shovels, rakes, etc.) within the ROW and in-place pipeline abandonment (removal of aboveground valves).

Insignificant or discountable contaminant exposure impacts may also occur during many of the activities. These types of impacts may occur during activities such as vegetation disposal and mechanized mowing/trimming, when there is a chance that a small amount of fluids could leak from the mowing/vegetation disposal equipment.

3.4.2 Potential Indirect Impacts

Permanent and temporary loss of wild blue lupine can result in longer term impacts to local KBB/FE populations as well as the direct effects to the species incurred during the season of work. Permanent and temporary loss of nectar species that are within 200 meters of the wild blue lupine patches (i.e., Covered Lands B) may also have an indirect effect on the Covered Species. For the purposes of this HCP, it was assumed that if permanent and temporary direct impacts were anticipated for a specific wild blue lupine patch, then indirect impacts on the surrounding wild blue lupine and nectar plants would also be probable.

Fragmentation of the Covered Species habitat is another potential indirect impact. As only a small number of NG's covered activities have the potential to impact large portions of occupied wild blue lupine/nectar habitat, only a few of NG's activities would be anticipated to fragment the wild blue lupine/nectar habitat. These activities include substation upgrades and expansion (i.e., expanding a fence perimeter, underground work, etc.); granting of ROW access to non-NG entities for the installation of permanent/temporary roadways, driveways, and gardens; and pipeline replacements (same size or larger). Descriptions of these activities are provided in Chapter 2, Covered Activities.

3.5 Estimate of Take

Estimating the potential take of KBB/FE, including take to their various life stages (eggs, pupae, larvae, and adults), can be a difficult task. Typically, it is not possible to accurately predict the loss of individual KBBs/FEs resulting from future activities. For example, locations and the number of individuals, particularly in the egg and larval stages, are usually unknown. Therefore, for the purposes of this HCP, we use habitat as a surrogate for KBB/FE. For vegetation management, take of KBBs/FEs is likely to be in the form of death of the egg (KBBs) and pupae (FEs) stages. Take will generally be limited to these life stages because the primary vegetation management will be restricted to September through March, when KBBs are overwintering as eggs and FEs are overwintering as pupae close or near the ground (see Sections 1.3.1 and 1.3.2). For other utility activities, take may occur at any life stage (egg, larvae, pupae, or adult) as O&M (including emergency responses), reconstruction and new construction activities may happen at any time of year. It is not anticipated that all KBBs/FEs will be killed at a given site from any of

these activities, as AMMs will be implemented to minimize impacts. However, a percentage of KBBs and FEs are anticipated to be killed or harmed from each wild blue lupine patch that is impacted.

The 2006 Baseline Survey identified approximately 29.3 acres of wild blue lupine populations on transmission ROWs in the Covered Lands that are managed by NG's electric and/or natural gas operations. Approximately 99% (28.6 acres) of the wild blue lupine populations are located within electric transmission line ROWs and less than 1% (0.66 acres) are located within natural gas ROWs. These populations range in size from approximately 0.000023 (Population NK83) to 3.04 acres (Population SS36b) for individual populations, and 8.25 acres for an aggregate (i.e., several small populations combined together) population (Populations GF59-62). The average size of the wild blue lupine populations located within the Covered Lands is 0.26 acres. The take of the Covered Species located within these 29.3 acres of wild blue lupine habitat is assumed to mostly occur as a result of vegetative maintenance and other utility-related activities.

In addition to the wild blue lupine identified along transmission line ROWs within the Covered Lands, approximately 0.28 acre of wild blue lupine habitat was identified along some distribution ROWs that NG shares with other ROW owners and users (other municipal or private utilities) (i.e., Covered Lands – Distribution Lines/Easements). Since distribution line-related easements have not been surveyed by the NYSDEC or by the entities that own and control them, it is assumed that an additional one acre of unidentified wild blue lupine populations could occur along some other distribution line in the Covered Lands-Distribution Lines/Easements. A boundary depicting the approximate location where this unidentified wild blue lupine habitat may be located was prepared by the NYSDEC and is illustrated in Appendix C Figure 2, Quads Containing Covered Lands. This additional one acre is to account for potential incidental impacts to unidentified wild blue lupine populations within Covered Lands – Distribution Lines/Easements. It is assumed that some take of the Covered Species located within the 0.28 acres of confirmed and 1.0 acres of estimated wild blue lupine habitat within Covered Lands - Distribution Lines/Easements could occur as a result of NG's O&M activities (covered in the HCP and mitigated for). It is important to note that the activities of the other easement users or owners could also result in some take of the Covered Species and/or their habitats.

Approximately 3.44 acres of wild blue lupine habitat were also identified within NG-owned parcels located adjacent to the transmission ROWs. The largest of these non-ROW areas is an approximately 3.25 acre wild blue lupine population located adjacent to the Spier-Queensbury #5 – Ogden Brook Tap 115kV ROW, in the Town of Queensbury, Warren County. The take of the Covered Species located within the 3.44 acres of habitat within NG-owned, non-ROW parcels is assumed to mostly occur as a result of illegal trespass by ATV users.

National Grid will periodically rebuild and refurbish its existing electric and natural gas infrastructure in the Covered Lands. There is the potential that some of these new construction activities may occur within or near surveyed wild blue lupine populations. Thus, reconstruction and potential new construction activities have been considered in estimating the total permanent impacts. These activities are described in Section 2.3.

Some future maintenance of the existing facilities could occur in response to damage caused by storm events, fire, vandalism, or equipment/material failure. Such future O&M activities involving the surveyed wild blue lupine populations will therefore be limited to occasional and intermittent inspection and maintenance work associated with vegetation and infrastructure maintenance activities.

National Grid will continue to conduct the covered activities in accordance with best management practices aimed at avoiding and minimizing impacts to known wild blue lupine populations and the Covered Species. Most of the AMMs included in this HCP (see Section 4.3) are the same measures that NG developed and implemented in coordination with the USFWS and NYSDEC, pursuant to the previous Federal permit.

National Grid has no historical data or basis for calculating or attempting to estimate the acreage of wild blue lupine populations on the affected ROWs that could be disturbed by its occasional, intermittent and temporary utility activities. For over a decade, NG performed its utility activities in accordance with the previous Federal permit (No. PRT-813745-1) and neither NG nor the USFWS/NYSDEC identified any obvious impacts to wild blue lupine populations or to the Covered Species that resulted from such activities.

A very conservative approach to developing an estimate of such acreage disturbances might be to simply assume that all 29.3 acres of wild blue lupine, and all of the KBBs/FEs utilizing this habitat, could be disturbed on an annual basis.

It is highly unlikely, however, that such an outcome would ever occur, given the scattered distribution of the populations and the unlikelihood of NG's vegetation and infrastructure inspection and maintenance activities being performed at all of these locations during the same relative timeframe. Therefore, it is highly unlikely that all 29.3 acres of wild blue lupine and all of the Covered Species utilizing this habitat will be impacted annually.

3.5.1 Vegetative Maintenance

NG's vegetative maintenance program, if performed during the April 1st to August 31st timeframe and if also done in an uncontrolled manner, could pose the greatest potential for causing take of the Covered Species and temporary impacts to their associated habitat. The most conservative approach for estimating the potential annual impacts to wild blue lupine habitat (and consequently the Covered Species that use this habitat) would be to assume that all 29.3 acres of wild blue lupine populations will be impacted during each cycle of the vegetation maintenance program (each area is maintained on a 3 to 5 year cycle). However, this is based on unreasonable assumptions and would yield a gross overestimate of the potential impacts, as it does not take into account NG's AMMs and best management practices, and the fact that the ROWs have been historically managed and are continuing to be maintained, so most of the ROWs will not need intensive vegetative maintenance. Within electric transmission ROWs, only selective trees and individual stems are removed by NG's foresters, and mechanical mowing normally only occurs on natural gas pipelines. Taking these factors into consideration, the total annual impacts upon wild blue lupine populations would be a fraction of the surveyed 29.3 acres.

A more reasonable approach to estimating potential annual impacts to wild blue lupine habitat within the Covered Lands includes an evaluation of the potential areas of disturbance and the anticipated frequency of the disturbance activities. Most ROW areas are already effectively being managed to encourage low-growth vegetation. Right-of-Way areas with higher vegetation that would need to be managed were estimated during the 2006 Baseline Survey. The total percent cover of tall-growing tree and shrub species located in the immediate vicinity (within ROW and within 200 meters) of the surveyed wild blue lupine populations was visually estimated. Based on this data, the total percent cover of tall-

growing tree and shrub species within 200 meters of the surveyed wild blue lupine populations was estimated at approximately 13%. This is the area where selective vegetative maintenance will be utilized to control the growth of woody vegetation and maintain the occurrence of nectar species and wild blue lupine.

Using this information, it is assumed that selective vegetative maintenance activities will be limited to a small percentage (approximately 3.72 acres [13% of 28.6 acres]) of the overall amount of wild blue lupine habitat present within the electric transmission ROWs. Selective vegetative maintenance activities will occur at different wild blue lupine populations during the life of the permit, depending on the growth and density of tall-growing tree and shrub species surrounding these populations. It should be noted, however, that each specific wild blue lupine area only has the potential to be impacted by vegetative maintenance activities every four years and only those stems of undesirable trees or tall shrubs will be targeted (not the entire area), further reducing the potential for large-scale impacts to the Covered Species, from such activities. All lupine patches on the electric ROWs may be infrequently temporarily impacted over the life of the permit either from vegetation maintenance or other activities (see below).

The area of wild blue lupine habitat surveyed along natural gas pipelines is only a small part (0.66 acres) of the total amount of wild blue lupine located within the Covered Lands. As mechanical mowing will normally occur only within natural gas ROWs, for the purposes of calculating the maximum anticipated take of KBB/FE, NG has assumed the worst case situation that all wild blue lupine populations along the natural gas transmission ROWs will be temporarily impacted, once every four years.

Based on use of the HCP's AMMs, including seasonal restrictions, there is no reason to anticipate permanent impacts to all 29.3 acres of wild blue lupine from NG's vegetative management program; however, temporary, infrequent impacts may occur to all of these populations at some point during the duration of the 50-year permit. Previous studies of NG's vegetation maintenance practices have determined that decades of such ROW management activities are largely responsible for creating and maintaining favorable ROW habitat conditions for wild blue lupine and the Covered Species (Forrester et al. 2005). Based on discussions with NYSDEC staff, such ROW management practices, on their own, are not enough to provide optimal habitats. Management of the understory and herbaceous growth, periodic soil disturbance, and control of ATV use on the ROWs are also needed to maintain and expand wild blue lupine habitat within the ROWs (NYSDEC pers. comm. 2008).

3.5.2 Operation and Maintenance (O&M), Reconstruction and New Construction Activities.

Even with the implementation of AMMs, there is some potential for wild blue lupine and the Covered Species to be permanently impacted by NG's performance of typical O&M activities (e.g., wood pole inspections, facility and access road repairs, and emergency restoration activities), reconstruction and new construction activities along some affected ROWs. While some utility activities can be beneficial toward maintaining open habitat for KBBs/FEs, other activities may eliminate current population levels of the Covered Species within the wild blue lupine populations adversely impacted by these actions. In this assessment, contractors do not result in increased impacts, since, as stated in Section 2.1.2, contractors are required to comply with the same EG documents as NG personnel.

These concerns are important in areas with widely scattered and semi-isolated wild blue lupine habitats (particularly in the Town of Queensbury, Warren County area) where the NYSDEC's on-site observations

indicate KBB/FE populations within NG ROWs are declining, even with the previously-permitted efforts by NG to support habitat for the Covered Species. If the impacts of such utility activities are not properly mitigated, these actions could result in increased rates of extirpation of isolated KBB/FE sites, raising concerns that as additional sites become extirpated, the remaining sites become further isolated and more vulnerable to natural cycles of abundance and potential extirpation caused by a single sufficiently large disturbance event. Therefore, only utility activities that are not properly mitigated are anticipated to result in increased rates of extirpation of isolated KBB/FE sites.

Based on a thorough evaluation of NG's covered activities, it was determined that the potential aerial extent of impacts for various utility activities would be relatively small, and would likely be measured on a typical scale of square feet, not acres. While any impacts that occur would be cumulative, (i.e., added to each other for an annual total), even these total impacts are expected to be small and localized. Thus, no widespread impacts affecting large areas or acreages of wild blue lupine habitat are anticipated. This is also expected to be the case for any future, major reconstruction or new construction projects on the affected ROWs, as such projects will be carefully planned and implemented to apply the HCP's AMMs and adaptive management provisions.

Considering all of this information, the project team conservatively developed an estimate of 3.5 acres of potential permanent habitat disturbance or loss that could occur over the 50-year life of the requested permit, as a result of NG's covered O&M activities. This estimate conservatively assumes loss of the majority of KBBs/FEs present within a 3.5 acre area and this acreage amount is deemed to be an adequate target amount for mitigating the incidental take of the Covered Species that results from NG's covered activities.

National Grid believes that implementation of carefully planned vegetative maintenance, in accordance with the HCP's AMMs, will contribute toward maintaining the continued existence of an early successional stage of vegetation (critical habitat) for the Covered Species. These continuing habitat benefits should compensate for the small, typically indiscernible habitat impacts and incidental take of the Covered Species that are an unavoidable consequence of even the most careful application of AMMs to NG's utility activities.

NG will mitigate for permanent habitat disturbance and potential take through a variety of strategies that are presented in the following section.

4.0 CONSERVATION STRATEGY

To eliminate, reduce, and mitigate for potential impacts to the Covered Species as a result of the covered activities, the following conservation strategy has been developed. The intent of the strategy is to provide long-lasting, net benefits for KBBs and FEs. The KBB and FE, like most insect species, have adapted to survival by producing relatively large numbers of eggs and having large populations with short individual life spans and frequent generation turnover (WDNR 2000). In fact, the longest period of the life span of an individual is spent in the egg and larval stage.

The survival strategy of the KBB/FE generally centers on the success of the overall population, not on the survival of the individuals. However, in New York, many populations are extremely small and isolated and impacts to individuals can result in increased rates of extirpation. Therefore, an appropriate conservation strategy must also focus on maintaining the host plant, a key strategy for assuring the survival of the species. This requires a shift in a typical conservation strategy of preserving individuals of a species to also preserving habitats and populations (Scott 1986).

By preserving existing habitat in an ecologically effective manner and creating additional habitat that connects existing populations, there is potential for growth of the overall KBB/FE population, as long as efforts are taken to not impact the last of the KBB/FE that would be available to occupy the habitat. Therefore, since the KBB/FE are so directly tied to their habitat (i.e., wild blue lupine), it is appropriate that the HCP's key management strategies focus on enhancing and increasing ROW habitat, as well as measuring the change in habitat as a potential measure of population fluctuations. Monitoring of KBB/FE populations will be also be undertaken to verify that the populations are increasing.

Since addressing severely depressed populations in the GLARU is a key part of the Recovery Plan , the HCP includes support of an experimental KBB translocation strategy that will focus on an area in the Town of Queensbury, Warren County. See Appendix H, 2010 APBPC Karner Blue Captive Rearing Protocol. This strategy will consist of translocating KBBs to existing habitat that occurs at a Town of Queensbury property located adjacent to a NG transmission line ROW. NG will provide funding and ROW access support to this effort, to be implemented by the APBPC, in coordination with the USFWS/NYSDEC. Those efforts will include post-translocation monitoring to determine the net benefit of the translocation program.

4.1 Biological Goals and Objectives

The long term viability of KBB and FE populations in New York State depends on perpetuating the required habitat for the Covered Species (i.e., wild blue lupine and nectar species in open areas of sandy soil). Without periodic disturbance and controls, succession of natural woody vegetation shades out wild blue lupine and nectar plants, which passively reduces and/or eliminates KBB habitat and reduces population levels. Creation of new habitat or the maintenance of the specific vegetation succession stage that the KBB requires is critical to their survival.

Fortunately, NG's goal of maintaining a low plant form on the ROWs is highly compatible with the management of butterfly habitat. Undoubtedly, the past decades of ROW management by NG has helped to provide a relatively constant habitat source for the New York KBB and FE populations. Unfortunately, KBB and FE populations have faced inclement weather and other threats and have

continued to decline along ROWs. However, it is possible that by increasing the frequency of vegetation management and planting new suitable vegetation, KBB and FE habitat can be enhanced. Further benefit has been achieved by the cooperative relationships between NG and the USFWS/NYSDEC to develop BMPs that achieve NG's goals and benefit the Covered Species, as well.

The overall biological goal for the NG HCP is to complement existing conservation efforts in New York State for the KBB and FE. National Grid will further expand upon their BMPs and vegetative management protocols, in an effort to meet this goal. The following objectives will be the focus of the conservation strategy.

- *Objective 1:* To focus NG's mitigation/restoration activities

    a) within the Albany Pine Bush and Queensbury viable KBB/FE population areas. The objective of the activities within the Albany Pine Bush Preserve area is to enhance ROW habitats that act as corridors among existing Preserve populations. This will be accomplished by linking existing populations of wild blue lupine habitat. The objective of the activities in the Queensbury area is to create and restore wild blue lupine habitat within the ROWs, to serve as primary habitat for the KBBs/FEs. There are currently no other existing wild blue lupine habitat units to link together in the general area of the ROWs. Efforts will also be expanded in the Queensbury area to provide supplemental KBB breeding populations through translocation efforts to increase the reproductive and colonization capacity of the species. See Appendix C, Figure 4, and the citation to Figure 17, which illustrates these corridors in the Queensbury area, and Appendix C, Figure 13, and the citation to Figure 16 for the Albany Pine Bush area. See also Appendix H, 2010 APBPC Karner Blue Captive Rearing Protocol.

    b) on strategically selected portions of NG's fee-title owned ROWs, adjacent NG property, and on easement lands only where permission has been granted by the landowner.

    c) in areas where ROWs are essential for providing strategic connectivity among isolated populations, (see Appendix C, Figures 3 through 15 which illustrate ROWs with Covered Species (red hatching), especially Figure 4 for Queensbury and Figure 16 for the Albany Pine Bush); and

    d) on or adjacent to ROWs near larger KBB/FE management units.

- *Objective 2:* To locate and work with existing NGOs having an interest in conserving and managing KBB/FE habitat (i.e., restore additional habitat near existing conservation lands).

- *Objective 3:* To avoid and/or minimize negative effects and actions (i.e., ATV use within ROWs) that are already occurring to the Covered Species habitat.

- *Objective 4:* To promote education/outreach regarding the Covered Species and conservation of their habitat.

- *Objective 5:* To improve and expand upon the 2006 Baseline Survey habitat acreage and also ensure that the amount of habitat for the Covered Species within the Covered Lands will not drop below the 2006 Baseline Survey habitat acreage of 34 acres.

4.2 Conservation Strategy Implementation

4.2.1 Overview of HCP Implementation

National Grid's Environmental Management personnel will serve as the HCP administrator, charged with implementing the HCP, and will oversee the monitoring, reporting, and adaptive management program. The responsibilities of the HCP administrator include:

a. Ensuring implementation of the HCP conservation program.

b. Implementing a monitoring program to determine the effectiveness of restoration/mitigation activities and to ensure fulfillment of compensation obligations. The HCP administrator will maintain all monitoring reports and archives and will prepare an annual HCP Monitoring Report which will be submitted to the USFWS and NYSDEC. See Chapter 5, Monitoring, Reporting, and Adaptive Management Program.

c. Employing adaptive management techniques as needed based upon the effectiveness of the mitigation measures, to modify or revise its conservation strategy to improve its effectiveness. See Chapter 5, Monitoring, Reporting, and Adaptive Management Program.

d. Implementing the Awareness and Alertness Program described in Sections 4.2.3 and ensuring implementation by personnel as described in Section 4.2.2.

4.2.2 HCP Implementation Personnel

National Grid Environmental Management personnel will administer and coordinate implementation of the HCP and compliance with the ITP, to be issued by the USFWS. National Grid's engineering and operations personnel and consultants will have the following key roles in the implementation of the HCP:

a. *Engineers, Planners, and Operations Managers:* National Grid technical personnel and managers who plan and schedule O&M activities on Covered Lands will coordinate with NG Environmental Services personnel to plan and schedule such activities and to implement the HCP's AMMs. These personnel will also ensure that field crews, including contractors, receive appropriate training to implement the HCP's AMMs.

b. *Field Supervisors:* National Grid field supervisors will oversee O&M activities on Covered Lands to ensure that the HCP's AMMs are implemented where required. Field supervisors will also ensure that field crews, including contractors, receive appropriate training to implement the HCP's AMMs.

c. *Field Crews*: National Grid field crews, including contractors that perform O&M activities on Covered Lands that are subject to HCP's AMMs and requirements will receive appropriate training on how to do so.

d. *Foresters:* National Grid foresters that oversee and coordinate ROW vegetation management activities on Covered Lands will do so in accordance with relevant HCP AMMs. In conjunction with ROW vegetation management activities, NG foresters will provide vegetation management plans for Covered Lands, and implement the modified vegetation management techniques for removing shrubs and low-growing trees from selected portions of strategically-selected ROWs (e.g., see Section 4.4.2). Foresters will also help coordinate site restoration/seeding of work sites disturbed by O&M activities (see Section 4.5.1 through 4.5.2).

e. *Security and Real Estate Asset Management*: National Grid security personnel will pursue enforcement of illegal ROW trespass and habitat damage by ATV users and other unauthorized users of the Covered Lands as specified in this HCP. National Grid real estate asset managers will screen ROW use requests by third parties, to assure that such uses will not interfere with or damage habitat areas on Covered Lands as specified herein.

f. *Contract Biologists/Consultants*: National Grid will hire contract biologists to conduct periodic habitat and KBB/FE surveys and monitoring required by the HCP and ITP. National Grid may also arrange to have contract biologists/consultants provide training of NG field crews on the proper implementation of the HCP's AMMs.

g. *Contractors*: Contractors may be hired to undertake ROW maintenance activities, or to assist NG with line repairs or vegetative management in the event of an emergency. As stated in Section 2.1.2, NG will ensure that contractors receive NG's applicable EG documents and HCP information before working within Covered Lands. Contractors will be required to comply with these EG documents and this HCP in the same manner as NG personnel.

4.2.3 Efforts in Advance of Field Work – Awareness and Alertness Program

National Grid will ensure that the following efforts are made in advance of any field work covered by this HCP.

National Grid Environmental Management personnel will ensure that all HCP Implementation Personnel have had training or knowledge of the HCP including an understanding of conditions suitable for wild blue lupine growth, the ability to recognize wild blue lupine plants, and an understanding how to implement AMMs in locations where wild blue lupine is observed by NG personnel or is otherwise made known to NG by USFWS, NYSDEC and/or the owner and controller of such lands.

When a work order is issued to undertake covered activities within the 20 quadrangles associated with this HCP, NG Environmental Management personnel will check the location of the work against the most current GIS survey data to determine if the work location is within a ROW with Covered Species (a red hatched ROW), and/or in the vicinity of known populations of wild blue lupine, nectar species, or otherwise in an area of Covered Lands. Maps showing known locations of wild blue lupine populations, nectar species or areas of mitigation or enhancement (Covered Lands C-E) will be provided to the Implementation Personnel.

Within Covered Lands – ROW for Survey, where there are no known populations of wild blue lupine, and also along distribution lines, where information about wild blue lupine populations is limited, the NG Environmental Management personnel will ensure that NG personnel conducting covered activities in these locations have knowledge of the HCP, will understand conditions suitable for wild blue lupine growth, and will be able to recognize wild blue lupine plants.

In the event that the presence of the wild blue lupine is made known to NG by USFWS, NYSDEC and/or the owner and controller of such lands or if NG personnel observe wild blue lupine in the field in a location where it was not previously known to occur, the field personnel who made the observation will submit that information back to the Environmental Management personnel, will undertake operations in the area as if it was a ROW with Covered Species, implement AMMs, and not take any action to cut,

remove, or spray pesticides or herbicides at the site without a site visit by an environmental monitor, except under declared emergency situations.

4.3 Avoidance and Minimization Measures (AMMs)

In preparation of this HCP, measures to avoid and minimize take of the Covered Species during NG's covered activities were identified and evaluated. Most of these measures were previously developed and implemented in accordance with the previous Federal permit and are currently followed as part of NG's standard operating procedures and/or BMPs. However, some additional measures will be implemented to provide additional protection for the Covered Species, and mitigation for potential impacts.

As described in Sections 1.2.1 and 1.2.2, Appendix C, Figures 3 to 15 illustrate those ROWs where Covered Species are present (i.e., red-hatching) versus those ROWs where Covered Species may be present (i.e., blue hatching). Except where noted, the AMMs below will be applied to ROWs where Covered Species are present (i.e., red hatching). These AMMs will also be applied to covered lands associated with mitigation and enhancement (Covered Lands C, D1 and D2 and E).

4.3.1 Vegetation Management

Avoidance and minimization measures will be applied in ROWs with Covered Species (i.e., red hatching on Appendix C, Figures 3 to 15), which include Covered Lands A and B, as well as Covered Lands C, D1, D2, and E.

To minimize the potential impacts from vegetation management activities, the following practices will be instituted:

a. Mowing, tree-trimming, and herbicide application activities will occur on a rotational sequence (every 3 to 5 years) from September 1st through March 31st. Vegetation maintenance activities will not be performed between April 1st and August 31st. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

b. During mowing activities, blades of mowers and brush hogs shall be set at least eight inches above ground level. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

c. Mowing shall be conducted no more than once a year. In rare occasions where mowing occurs annually, mowing will not be conducted more than once in a year. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

d. Tree girdling may be completed any time of the year. Hand-pulling of individual shrubs/trees, which do not uproot wild blue lupine plants, may occur at any time of the year. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

e. Herbicide Application. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

- Herbicides shall be applied by personnel who are pesticide-certified and trained in identifying wild blue lupine populations and KBB/FE. All applicators shall be instructed to take care in avoiding stepping on wild blue lupine and/or accidentally spraying wild blue lupine or nectar species.
- Herbicide treatment shall be applied when conditions do not permit drift (i.e., wind speeds are $\leq$ 5 m.p.h.). This measure is currently enacted by NG.
- Herbicides shall not be applied using an open container. This will reduce the risk of spills.
- Filling and emptying of herbicide containers shall occur at a distance of greater than 250 feet from KBB/FE habitat.
- All herbicide applicators shall carry or have a spill kit immediately available (on person or in vehicle).
- All herbicide application equipment (i.e., hoses, tanks, clamps) shall be inspected prior to use each treatment day.

4.3.2 All Other Covered Activities

Avoidance and minimization measures will be applied in ROWs with Covered Species (i.e., red hatching on Appendix C, Figures 3 to 15), which include Covered Lands A and B, as well as Covered Lands C, D1, D2, and E. Avoidance and Minimization Measures g, h, i, and k below are especially relevant to Covered Lands F.

a. Vehicle use shall be minimized whenever possible (i.e., conduct patrols by foot). This AMM is the responsibility of all HCP Implementation Personnel.

b. Walking/driving directly through wild blue lupine/nectar plants shall be avoided unless absolutely necessary. This AMM is the responsibility of all HCP Implementation Personnel.

c. As outlined in NG's EG-303 document, "ROW Access, Maintenance and Construction Best Management Practices (BMPs)," abandoning pipe and construction debris (leaving on surface) will be avoided. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

d. NG will not intentionally introduce invasive plant species into the Covered Lands. Areas that are disturbed during O&M activities will be revegetated with indigenous, non-invasive species, preferably nectar species suitable for KBB/FE habitat. This AMM is the responsibility of all HCP Implementation Personnel.

e. Piling, stacking, chipping, or dragging of vegetation will be avoided to the greatest extent possible. If vegetative disposal cannot be avoided, the vegetation will be removed by the least intrusive method. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

f. Prior to conducting painting or other chemical applications to poles or other structures, tarps or other lightweight protective cloth barriers will be placed over any nearby wild blue lupine populations so that paint or chemicals will not fall onto the plants. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

g. An outreach program will be implemented to nearby landowners. The program will emphasize the importance of protecting KBB/FE habitat and the need to eliminate ATV usage and dumping (i.e., garbage, lawn clippings, etc.) on ROW easements. This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

h. National Grid will continue to conduct security patrols and to request local law enforcement participation in areas where ATV trespass is a known concern. This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

i. National Grid will contact local ATV associations (i.e., Albany-Greene ATV Association, Inc., All County ATV Club) to communicate the importance of staying off NG land and ROWs and other private property. This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

j. National Grid will support the USFWS' and NYSDEC's environmental enforcement actions and local law enforcement efforts to prosecute illegal ATV and other types of trespass upon NG land and ROWs. This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

k. When working within the Covered Lands identified in this Section, NG employees will have fuel oil and spill kits immediately available. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, field crews and foresters.

l. During any pipeline hydrostatic testing events, no water will be discharged into the Covered Lands identified in this Section. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, and field crews.

m. Snow plowing will be minimized along ROW access roads. Blades will be lifted when they are off pavement. In off-access road areas, blades should be elevated to heights that leave approximately six inches of snow cover remaining. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, and field crews.

n. Salt applications will be minimized. If possible, clean sand without weed seed will be used in place of salt. This AMM is the responsibility of NG Environmental Management Personnel, engineers, planners, operation managers, field supervisors, and field crews.

o. Signs that alert personnel that they are working in a sensitive area will be posted. This AMM is the responsibility of NG Environmental Management Personnel.

p. National Grid will instruct all individuals involved in O&M activities about the presence and status of the Covered Species and their associated habitat in NG ROWs. All O&M personnel will be trained to identify wild blue lupine and KBBs/FEs and advised of the importance for proper implementation of AMMs while completing field work in or near KBB/FE habitats. This AMM is the responsibility of NG Environmental Management Personnel.

q. National Grid will not permit incompatible uses of fee-owned ROWs that have surveyed wild blue lupine patches (i.e., Covered Lands A). This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

r. National Grid will not grant use of their ROWs for activities (i.e., temporary or permanent roads) that pose adverse impacts to the Covered Species and their habitat. This would include

potentially damaging or incompatible uses. Exceptions to this AMM would only be made with the explicit approval of the USFWS and NYSDEC, and would be for activities like the Town of Queensbury or the APBPC requesting access to adjacent habitat that is identified for improvement or management. Access would be granted in those cases with the approval of the USFWS and NYSDEC and conditioned that access is not through lupine patches and that nectar and grass areas are avoided. This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

s. For future subdivisions with access routes that cross ROWs, developers will be required to install and insure maintenance of fencing and gates. This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

4.3.3 Restrict Illegal ROW Trespass (Covered Lands F) and Conduct Public Outreach

Restrict Illegal ROW Trespass: This AMM is the responsibility of NG Environmental Management Personnel, and Security and Asset Management.

Observations of illegal trespass and unauthorized uses of NG's ROWs for dumping of lawn waste, illegal ATV activity, and other encroachments are common in some sections of the Covered Lands. Due to the extent of ROWs which have the potential to contain wild blue lupine habitat (about 24.3 miles of Covered Species ROW for electric lines, 24.8 miles of Covered Species for electric sub-transmission lines, and 13.6 miles of Covered Species ROW for natural gas ROWs) it is not feasible to erect a barrier over the entire length of ROWs within the Covered Lands. Therefore, priority areas will be restricted first, and as time, manpower, and funding allow, other areas will be identified during the monitoring program and managed through the adaptive management program. While NG is not directly responsible for these activities, NG will attempt to restrict access, where practicable, and pursue enforcement actions in cooperation with the USFWS, NYSDEC and local law enforcement.

In the first year of the ITP period, the following actions will be undertaken:

Restrictive devices such as boulders, gates, or other barriers will be placed at strategic locations along the Spier-Queensbury #5-Ogden Brook Tap 115kV ROW (Town of Queensbury, Warren County). See Figure 20, Restriction of Illegal ROW Trespass. Signage will also be erected to designate protected wildlife areas and to alert trespassers of federal fines.

In the first year of implementation, two of the top three priority areas (as identified by the NYSDEC) will be managed with restrictive access. National Grid will also work with federal, state, and local law enforcement officials to implement effective mechanisms for prosecution of trespassers. Through the adaptive management program, additional barriers may be installed, new restrictive devices may be utilized (e.g., surveillance cameras along ROWs), and/or increased public outreach may be implemented. If illegal trespass continues after implementing the adaptive management program, consultations with the USFWS and NYSDEC will be conducted.

National Grid will specifically target some illegal lawn waste dumping areas identified by the NYSDEC, at the Queensbury-Henry St. #14 34.5kV ROW, between Upper Sherman Avenue and Clark Street and an approximately 1-mile segment of the Spier-Queensbury #17/5 115kV ROW running east-west and crossing Dixon Road in the Town of Queensbury, Warren County. These areas will be addressed by contacting the suspected adjacent landowners and emphasizing the prohibition of such activities. As

appropriate, the installation of restrictive devices such as barriers and fencing will also be evaluated for these areas.

Coordination with local police departments and with USFWS and NYSDEC enforcement authorities will likely be necessary for this task. It is anticipated that through enforcement actions taken against trespassers, restoration of habitats disturbed or damaged by trespass will be imposed upon the responsible parties. If restoration is not deemed by the USFWS and NYSDEC to be beneficial at a particular disturbance site, NG suggests that any compensation received as a result of enforcement actions within the Covered Lands be used by these agencies, for the purpose of mitigation or habitat enhancement, for the Covered Species. This includes donations to the APBPC for the purposes of restoring habitat and planting wild blue lupine within the Albany Pine Bush Preserve and/or to TNC.

Benefits to the Covered Species and their habitat as a result of restricting illegal ATV trespass and illegal dumping of lawn waste within the ROWs cannot be enumerated at this time; however, significant long-term, positive benefits are anticipated. It is anticipated that future monitoring activities may allow for a more quantitative accounting of such acreage changes stemming from such trespass control.

Public Outreach: The Public Outreach Effort described here is intended to complement and reinforce the efforts described above. This enhancement measure is the responsibility of NG Environmental Management Personnel, and Security and Real Estate Asset Management.

During the first year of HCP implementation, NG will conduct public outreach efforts with the following entities, in an effort to promote awareness of NG's HCP and the effects of trespass and unauthorized uses upon KBB/FE habitats that occur on some NG ROWs:

a. Existing and new landowners located adjacent to the Covered Lands A, B, C, D, and E;

b. ATV clubs or organizations that are known to operate in the near Covered Lands A, B, C, D, and E;

c. Local sheriffs, Town police offices and local judges (to encourage enforcement of ATV trespass regulations and use of fine/penalty-related funds for KBB/FE habitat restoration/mitigation, in coordination with the USFWS/NYSDEC); and

d. Local media – NG will coordinate with the USFWS and NYSDEC regarding potential, joint press releases (e.g., informational flyers) announcing acceptance/implementation of the HCP and of its general conservation strategies, particularly regarding enforcement of ROW trespass.

The additional need for public outreach will be addressed under the adaptive management program. Additional measures that may be completed include increasing the number of public outreach events, circulating different types of outreach materials, and/or coordinating public outreach events with the USFWS, NYSDEC, or local NGOs.

4.4 Mitigation Measures

For the 50-year duration of the HCP and ITP, the total anticipated worst-case scenario adverse impacts are 3.5 acres (comprised of multiple small patches) of permanent habitat loss and periodic temporary impacts to all lupine habitat (≥34 acres) throughout the entirety of Covered Lands, and loss of associated KBBs/FEs could result from the covered activities. Although implementation of AMMs during the

performance of NG's covered activities will help to protect the Covered Species and their habitats, it is possible that some take of KBB and FE (particularly in the egg and larvae stages) may occur. Beneficial impacts from ROW vegetation management are the maintenance of KBB/FE habitat. Given that lupine requires periodic disturbance, even with wholly beneficial management of sites for KBB/FE, some impacts to individuals of the species are likely.

To compensate or mitigate for the impact of the take of KBBs/FEs associated with these activities, NG proposes to create an approximately 5-acre off-ROW preserve for the Covered Species (Covered Lands C) and also enter into an agreement with the APBPC to develop about 23 acres of wild blue lupine habitat within a fee-owned ROW, located adjacent to the Albany Pine Bush Preserve (Covered Lands E). These mitigation measures are described below at Sections 4.4.1 and 4.4.2, respectively. These actions will mitigate the impact of the take of KBB/FE to the maximum extent practicable because the impacts are small and from multiple (sometimes isolated) unprotected populations while the mitigation is larger blocks, connects habitat and populations and is in protected areas.

The mitigation measures occur within USFWS/NYSDEC designated priority conservation areas and include specific NG fee-owned ROWs or parcels located in the Albany Pine Bush Preserve and Queensbury areas. Additional enhancement measures are discussed below in Section 4.5.

A schedule for mitigation and enhancement measures is provided in Section 4.6. The restriction of illegal ROW trespass (Covered Lands F) is provided above in Section 4.3.3.

4.4.1 Establish an Off-ROW Preserve – Covered Land C

This mitigation measure is the responsibility of NG Environmental Management Personnel, and may be implemented by field supervisors, field crews, foresters and possibly contract consultants/biologists.

Within the first five years following the anticipated successful cessation of ATV trespass (see Section 4.3.3), NG proposes to establish a 5-acre off-ROW preserve on a NG-owned parcel of land located in the Town of Queensbury, Warren County, New York. This is known as Covered Lands C. The off-ROW preserve is proposed to be placed on a 5-acre portion of the 24.67-acre parcel that is identified on the tax map as parcel 309.5-1-4. Based on use of a Sales Comparison Approach, NG has estimated the market value of dedicating this 5-acre area for an off-ROW preserve area to be approximately $80,000. NG proposes to execute a conservation easement, other document with enforceable restrictions binding on NG and its successors acceptable to USFWS and NG, relating to this 5-acre preserve area.

Appendix C, Figure 17, Summary of Mitigation and Enhancement Measures, illustrates this site in relationship to other mitigation and enhancement measures in this area. Figure 19, Off-ROW Preserve Area, depicts the location of this proposed 5-acre preserve. Figure 20 illustrates Covered Lands C in relationship to the areas for Restriction of Illegal ROW Trespass (Covered Lands F).

This parcel is associated with the Ogden Brook Substation property and adjacent Spier-Queensbury #5-Ogden Brook Tap ROW. It is also located in the immediate vicinity of wild blue lupine ROW populations GF59-62. The anticipated habitat development of this 5-acre preserve will mitigate for the estimated 3.5 acres of potential permanent habitat disturbance or loss that could result from the covered activities, over the anticipated 50-year ITP duration.

Compared to small, isolated wild blue lupine populations, the off-ROW preserve will be beneficial to the Covered Species because it will provide a relatively large refuge area that will be less susceptible to stochastic weather events and it will allow for potentially greater reproductive success. Habitat management within the preserve will be more effective as will protection from illegal trespass.

Based on the Baseline Survey, an approximately 3.3 acre portion of this NG-owned parcel and a portion of the adjacent Spier-Queensbury #5-Ogden Brook Tap 115kV ROW is currently populated with a large aggregate wild blue lupine population (GF59-62) and the remaining portion of the preserve area is currently forested. National Grid will selectively clear and remove undesirable tree species from about 1.25 acres of the forested portion of the proposed preserve area. The selective clearing will provide more favorable growing conditions for wild blue lupine and enhanced habitat conditions for the Covered Species. Wild blue lupine and other native nectar species will be planted within the dedicated preserve area. Conserving and promoting further habitat growth in the preserve area and in the immediate vicinity of a large and established area of occupied habitat will be very beneficial to the Covered Species, as nearby populations will likely populate this area. KBB/FE habitat will be maintained at the site in perpetuity. NG and USFWS will develop the terms of a conservation easement for the off-ROW preserve and NG will execute and record the easement prior to conducting activities that are likely to cause permanent impacts as defined in this section 3.4

4.4.2 Develop ROW Habitat at the Albany Pine Bush Preserve - Covered Lands E

National Grid will implement management activities to create and/or enhance KBB habitat on 23 acres of National Grid fee-owned ROW adjacent to Albany Pine Bush Preserve lands and annually report on the status of these management activities. This management commitment will continue for the duration of the incidental take permit and be enforced through the IA and in the permit conditions. National Grid presently intends to establish a binding contract with APBPC to carry out these management activities. This mitigation measure is the responsibility of NG Environmental Management Personnel. Through a contractual arrangement with the APBPC, NG will provide the APBPC with $50,000, access rights and habitat management rights, to develop and manage vegetation on 23 acres of the fee-owned Rotterdam-Woodlawn 35 115kV and Woodlawn-State Campus 12 115kV electric transmission line ROW, located adjacent to the Albany Pine Bush Preserve (City of Albany and Towns of Guilderland and Colonie, Albany County). This is known as Covered Lands E. Appendix C, Figure 16, APBPC Habitat Management Area, illustrates the location of the management area (see Appendix C, Maps). Habitat management, including controlled burns and targeted removal of woody shrubs, will be conducted by the APBPC within the fee-owned ROWs. The APBPC is currently authorized to conduct prescribed fires in occupied KBB habitat provided adequate unburned refugia remains and that the burn plans are coordinated with the USFWS and NYSDEC annually. This includes identifying areas to be burned relative to past practices. The APBPC would include any managed NG ROW areas in their annual planning and reporting process and any take associated with these activities would be covered under their ESA and ECL authorizations. Subsequent planting of wild blue lupine will also be conducted. Such efforts will help to link preserve habitats that occur on each side of these ROW and to increase the habitat acreage for the Covered Species by approximately 23 acres. A signed letter of intent that documents the APBPC's interest in conducting the habitat management work within NG's ROWs is provided in Appendix E, Letters of Intent.

Within the first 90 days after ITP issuance, NG will execute a binding contract between NG and APBPC, or another suitable entity, to create or enhance KBB habitat on NG fee-owned ROW adjacent to Albany Pine Bush Preserve lands or NG will provide and implement its own plan for management of the ROW.

Subsequently, should APBPC (or any other entity under contract to perform management activities) not be able to conduct agreed upon management activities at any time throughout the life of the ITP, NG will contract with another suitable entity to conduct the management activities or may conduct the activities themselves with additional compliance monitoring responsibilities.

4.5 Enhancement Measures

Additionally, and although not required, NG will be proactive and conduct enhancement measures above and beyond the regulatory requirements that should result in the ultimate creation and promotion of habitat within strategically-selected ROW areas of the Covered Lands. For the purposes of this HCP, these habitat enhancement measures will not be used as mitigation for potential impacts to the Covered Species. In addition to restoring and connecting habitat on NG ROWs, NG will also fund KBB translocation efforts in the Town of Queensbury, Warren County area on a piece of property not controlled by NG, as discussed below in Section 4.5.3. These habitat enhancement measures are described in the following sections.

4.5.1 Conduct Enhanced ROW Vegetation Maintenance – Covered Lands D1

This enhancement measure is the responsibility of NG Environmental Management Personnel, and may be implemented by engineers, planners, operation managers, field supervisors, field crews, foresters and monitored by contract biologists/consultants.

NG will modify their existing vegetation management techniques within a fee-owned segment of the Spier-Queensbury #17/5 115kV ROW, between Upper Sherman Avenue and Morningside Circle, in the Town of Queensbury, Warren County. This is known as Covered Lands D1. These measures are illustrated in Appendix C, Figure 4, which illustrates the general location on the Glens Falls Quadrangle; Figure 17, which provides a summary of all mitigation and enhancement activities in the Queensbury Area; and Figure 18, which illustrates the location of this ROW.

The ROW area selected for the enhanced vegetation management program is approximately 12 acres in size. This ROW was selected for enhanced vegetation management (removal of woody vegetation) because it contains suitable conditions for the natural establishment of nectar plant species and wild blue lupine. This is evidenced by the fact that the ROW already includes wild blue lupine populations GF62a-62b, GF63a-63c, GF64a-64b, GF65a-65c, GF66a-66e, and GF67a identified in the 2006 Baseline Survey. These individual wild blue lupine populations would also be identified as Covered Lands A. The ROW is also located in one of the USFWS/NYSDEC priority conservation areas and it is near other populations of wild blue lupine that can be linked, to provide a more contiguous habitat area.

Modification of the vegetation management program within selected portions this fee-owned ROW area will create a grassland community that will favor the natural expansion of the wild blue lupine populations and other nectar plant species. Assuming a conservative estimate that successful establishment of suitable food resources (e.g., nectar plant species) will expand over approximately 50% of the ROW segment, it is anticipated that approximately 6 acres (12 acres of ROW x 50% = 6 acres) of suitable habitat for the Covered Species could be established within this portion of the Covered Lands, within an assumed 8 to 12 year period, as a result of this undertaking. Appendix C, Figure 18, Enhanced ROW Vegetation Management Area, illustrates the location of this segment of ROW (see Appendix C, Maps).

The primary focus of the enhanced vegetation management program at this ROW under Covered Lands D1 will be the elimination of woody shrubs and low-growing trees, the associated vegetation layer that would otherwise shade-out wild blue lupine and nectar species to the point that they cannot survive. Periodic soil disturbances will also be carried out in conjunction with vegetation management activities. Undesirable plant species such as poison ivy, black locust, scrub oak, and non-native grasses that have become established in areas prone to yard waste dumping will also be removed, to increase the potential for wild blue lupine and other nectar plant growth. It should be noted that the enhanced vegetation management program will still be compatible with NG's continuing O&M program and NG's existing ROW access paths and structure work areas will also be maintained so that the covered activities can be continued without constraints.

The monitoring program described in Chapter 5 will be implemented to track the success of the enhanced vegetative management program and any necessary modifications will be addressed through the adaptive management program. Future, adaptive management of this ROW area may include planting of wild blue lupine in coordination with the USFWS/NYSDEC. Planting of wild blue lupine will be carefully planned to maintain NG's access to its infrastructure and ROW and is described below under Covered Lands D2.

4.5.2 Conduct Specialized Habitat Site Restoration in Selected ROWs – Covered Lands D2

This enhancement measure is the responsibility of NG Environmental Management Personnel, and may be implemented by engineers, planners, operation managers, field supervisors, field crews, foresters security and real estate asset management personnel, and monitored by contract biologists/consultants.

NG will conduct habitat site restoration at the Spier-Queensbury #17/5 115 kV ROW (also under Covered Lands D1) and Spier-Queensbury #5-Ogden Brook Tap 115 kV ROW (also under Covered Lands F). These areas are illustrated in Appendix C, Figure 17. The Spier-Queensbury #17/5 115 kV ROW (see Covered Lands D-1 above) is the north-south ROW in the western portion of this figure. The Spier-Queensbury #5-Ogden Brook Tap 115 kV ROW (also under Covered Lands F) is located in the southern portion of this figure and runs from east to west between the Covered Lands C area (on the east end) and Covered Lands D1 (on the west end).

As described in Chapter 3, some of NG's routine O&M and vegetation maintenance activities could result in some ground disturbance, such as soil rutting and/or topsoil scarification. In the event that such disturbances occur on the Spier-Queensbury #17/5 115kV ROWs (Covered Lands D) NG will provide necessary grading/soil preparation, and seed a native nectar species/grass seed/lupine mix at the disturbance site.

In addition to restoring ground disturbances created by NG's covered activities, NG will also restore ATV-damaged habitat on the Spier-Queensbury #5-Ogden Brook Tap 115kV ROW (Town of Queensbury, Warren County). Following successful cessation of ATV trespass along this ROW, damaged areas will be restored by grading, soil preparation, and seeding with wild blue lupine and other, native nectar plants. Wild blue lupine seeding will be carefully planned to maintain NG's access to its infrastructure and ROW.

National Grid estimates that approximately 0.50 acres of suitable habitat could be created as a result of conducting such specialized site restorations, on an annual basis. Over an anticipated 50-year ITP duration, an estimated 25 acres (50 years x 0.50 acres per year = 25 acres over 50 years) of suitable

habitat could be established within the Covered Lands, as a result of this undertaking. Any restored areas identified as containing wild blue lupine habitat during subsequent surveys will become part of Covered Lands A and appropriate AMMs will be applied in the future. Until ATV trespass is controlled, NG will conduct site restoration in ROW areas where ATV trespass is not occurring. Following successful cessation of ATV trespass along the Spier-Queensbury #5-Ogden Brook Tap 115kV ROW, site restoration activities will occur within this ROW to restore ATV-damaged areas.

4.5.3 Translocation of Karner Blue Butterflies

This enhancement measure is the responsibility of NG's Environmental Management Personnel. This enhancement measure is not identified as a covered land, and acreage is not being counted in the overall assessment of enhancement as the effort is only being funded by NG.

Currently, a two acre parcel (candidate release site) has been identified during discussions with the USFWS and NYSDEC. This property is located north of Luzerne Road and is at the southeast corner of the intersection of NG's Spier-Queensbury #17/5 115kV and Spier-Queensbury #5-Ogden Brook Substation Tap 115 kV ROW and is owned by the Town of Queensbury. The site is illustrated in Appendix C, Figure 17, which provides a summary of mitigation and enhancement measures in this area of Queensbury.

Karner blue butterfly populations in the Town of Queensbury, Warren County area are at critically low levels, such that future mitigation and enhancement activities designed to provide additional habitat in this area may prove to be unsuccessful due to the lack of suitably robust, resident populations capable of colonizing the newly created habitat. Based on this condition, the USFWS and NYSDEC have recommended that NG's HCP conservation strategy support a KBB population augmentation program.

NG's commitment to this enhancement measure is to a) contract with and provide $5,000 to the NYSDEC, APBPC, or Town of Queensbury for habitat enhancement measures at the candidate site; b) contract with and provide the APBPC with a payment of $15,000 for KBB translocation services, c) allow the NYSDEC, APBPC and/or Town of Queensbury access rights over NG ROW to support habitat enhancement and KBB translocation effort, and d) during and following the translocation program, increase security patrols in this portion of the ROW to prevent disturbances to KBBs or their habitat. The following describes how NG's funding, permission for ROW access, and increased security patrols integrates with the efforts of others involved.

Wild blue lupine habitat currently exists within the two acre parcel and the habitat within the site is currently being managed by the NYSDEC. The two acre site was identified by the NYSDEC as being particularly appropriate for habitat enhancement and KBB reintroduction because not only does it contain wild blue lupine habitat, but additional wild blue lupine is found on an adjacent 10 acre parcel (NYSDEC personal communication). In addition, since the candidate site is located adjacent to the section of the Spier-Queensbury #17/5 ROW that will be receiving an enhanced vegetative maintenance program, it is anticipated that suitable habitat will also be established within NG's ROWs (Covered Lands D) as described in this HCP (See 4.5.1 above).

The enhancement measure, to be undertaken by others, with funding from NG, is proposed as a five year effort, and anticipated to start within the first five years of the HCP implementation. During the first two years of the program, the NYSDEC, APBPC, or Town of Queensbury will undertake habitat enhancement activities including tree removal, invasive species removal, and possibly the supplemental

planting of wild blue lupine/nectar species at the candidate site. These habitat enhancement efforts will help insure that proper site conditions are established prior to translocating the KBBs. As stated above, NG will contract with the agency responsible for the candidate site enhancement efforts, and will provide a payment of $5,000, for these habitat enhancement services. Since the site is currently being managed by the NYSDEC, NG anticipates that the NYSDEC will continue with this habitat enhancement task. National Grid will provide ROW access rights from NG's property to the candidate site for workers involved in undertaking and monitoring the habitat enhancement activities.

National Grid will also contract with the APBPC to provide the translocation services, to include the employment of a summer intern to help facilitate the translocation efforts. It is anticipated that a payment of $15,000 will be made to the APBPC during the startup year of the HCP, but that the translocation services may not be performed until about year 3 of the translocation program, after the NYSDEC deems the habitat suitable for the KBB translocation efforts. A signed letter of intent that documents the APBPC's interest in hiring and managing an intern to conduct this work is provided in Appendix E. The APBPC intern will be responsible for traveling to a New Hampshire Fish and Game's KBB breeding facility to help rear KBB larvae. Once the KBB larvae transform into tiny hard-shelled chrysalis, the intern will transport the pupae back to the Queensbury candidate site and release them in specially designed nets where they will emerge as adult butterflies, several days later.

Post-emergence monitoring will be conducted by the APBPC intern in late summer (July-August) to document successful emergence and reproductive success. Translocation efforts will take place for three years. It should be noted that during the first year of KBB translocations, monitoring will only occur during the second brood/flight period; however, during the second and third years of translocation, KBB monitoring will occur during both the first and second flight periods. KBB population levels will continue to be monitored through the HCP monitoring program (see Section 5.1). During and following the translocation program, increased security patrols will be conducted by NG to prevent disturbances to KBBs or their habitat.

The current translocation protocol is found in Appendix H, 2001 APBPC Karner Blue Captive Rearing Protocol. This protocol calls for the APBPC intern to capture and release KBB pupae. However, if technological advances and supporting studies document the successful translocation of this species in another phase (e.g., eggs, larvae, adults), then consideration will be given to modifying the translocation protocol, providing the budget allotment for this task is not exceeded by this change.

4.6 Summary and Schedule of Mitigation and Enhancement Measures

4.6.1 Summary of Mitigation and Enhancement Measures

The estimated impact of the impacts to KBB/FE associated with temporary disturbance of up to 29.3 acres, as well as 3.5 acres of potential permanent habitat disturbances or loss that could result from conduct of the covered utility activities, over the anticipated 50 year ITP period, will be effectively mitigated by:

- establishing a permanent 5-acre, off-ROW KBB/FE preserve at a NG property located in the Town of Queensbury, Warren County (Covered Lands C); and
- implementing management activities to create and/or enhance KBB habitat on 23 acres of National Grid fee-owned ROW adjacent to Albany Pine Bush Preserve lands and annually report on the status

of these management activities (Covered Lands E). This management commitment will continue for the duration of the incidental take permit and be enforced through the IA and in the permit conditions. National Grid presently intends to establish a binding contract with APBPC to carry out these management activities. In the event that APBPC cannot fulfill the contract, National Grid will contract with another suitable entity to conduct the management activities or may conduct the activities themselves with additional compliance monitoring responsibilities.

As shown below in Table 3, the HCP's proposed mitigation and additional habitat enhancement efforts have the potential of providing an estimated 59 acres of additional habitat for the KBB/FE. Additional habitat enhancement measures that are proposed to be undertaken by NG, such as enhanced ROW vegetative maintenance and restoration of ATV-damaged areas and other areas disturbed by NG's covered activities will also be beneficial to the Covered Species. Translocation of KBBs into the Queensbury area is also anticipated to have a positive effect on the recovery of KBBs in the Queensbury area. The existing wild blue lupine ROW habitat within the Covered Lands will continue to be protected by NG's implementation of AMMs during performance of its utility activities. These ROW habitats will be further supported by the continuation of NG's vegetative management techniques which have been shown to benefit the spread and growth of wild blue lupine (Forrester et al. 2005). The benefits to the Covered Species and their habitat resulting from conducting public outreach cannot be enumerated at this time; however, positive benefits are anticipated.

4.6.2 Schedule of Mitigation and Enhancement Measures

Section 4.3.3 discusses the schedule for restriction of illegal ROW Trespass (Covered Lands F). Section 4.3.3 describes the public outreach efforts to inform the public about the need to not trespass on NG ROWs. Given those schedules, NG anticipates the following overall schedule for the implementation of Mitigation and Enhancement Measures. This overall schedule is also summarized on Table 3.

Prior to Conducting Activities Within Covered Lands that will likely cause Permanent Impacts (as defined in section 3.2): NG will reach agreement with the USFWS on the terms of and signatories to a conservation easement for the off-ROW preserve at Queensbury and execute and record the easement document, including obtaining any necessary approvals.

1st Year: Within the first 90 days after ITP issuance, NG will execute a binding contract between NG and APBPC, or another suitable entity, to create or enhance KBB habitat on NG fee-owned ROW adjacent to Albany Pine Bush Preserve lands or NG will provide and implement its own plan for management of the ROW. Within the first year, NG will initiate ROW habitat management at the Albany Pine Bush Preserve. APBPC personnel would initiate actual ROW habitat improvements on a continued, annual basis. Establish an off-ROW preserve at Queensbury (first step would be having NG Forestry contractor conduct selective tree-cut/slash disposal at the preserve site; subsequent habitat development activities would occur in 3rd year and in subsequent years, subject to the successful cessation of ROW trespass by ATV users. Conducting Public Outreach (particularly warning about ROW trespass) will be continued on an on-going basis.

2nd Year: Initiate enhanced ROW vegetation management program. National Grid's forestry contractor would conduct selective shrub cut/removal.

3rd Year: Initiate specialized restoration within select ROWs (subject to successful cessation of ROW trespass by ATV users). Translocate KBBs to 2-acre candidate site (subject to coordination/scheduling with and by NYSDEC and the APBPC).

Table 3: Summary of Potential Acreage Increases from Proposed Mitigation and Enhancement Measures

Covered Land Identification Location (Figure where shown)*	Conservation Strategy Type	Measure	Schedule	Potential Acreage
Covered Lands E ROW near Albany Pine Bush Preserve (Figures 13 & 16)	Mitigation	Develop ROW Habitat	Year 1: Execute agreement with APBPC (or other entity). Years 1 onward, APBPC implements plan.	23
Covered Lands C Off-ROW near Substation at Spier-Queensbury #5-Ogden Brook Tap 115kV (Figures 4, 17 and 19)	Mitigation	Establish Off-ROW Preserve	Year 1: Develop (and initiate execution[6] of) Conservation Easement. Year 1 tree/overstory removal. Year 2 shrub removal. Years 3 onward complete habitat restoration after cessation of ATV Trespass	5
Total Acreage for Mitigation Measures				*28*
Covered Lands D1 Spier-Queensbury #17/5 115kV (Figure 4, 17 and 18)	Enhancement	Conduct Enhanced ROW Vegetation Management	Years 3 onward	6
Covered Lands D2 (also conducted on Covered Lands D1)[7] Spier-Queensbury #5-Ogden Brook Tap 115kV and Spier-Queensbury #17/5 115kV (Figure 4, 17, 18, 20)	Enhancement	Conduct Specialized Habitat Restoration within Select ROWs	Years 3 onward	25
Near Covered Lands D1 and D2 (Figure 4 and 17)	Enhancement	Translocate KBBs to 2-acre candidate site	Year 3	-
Total Acreage for Enhancement Measures				*31*
Total for Mitigation and Enhancement Measures				**59**
Note: * indicates that all figures are found in Appendix C.				

[6] Due to the processing times of conservation easements, this may not be completed within Year 1; however, USFWS may condition any permit such that no activities that may cause permanent impacts to KBB/FE habitat will occur prior to execution of the easement.

[7] As stated on Page 9, is noted that for the Queensbury Mitigation and Enhancement Areas, there is some overlap of the Covered Lands C, D1, D2, and F. For example, Covered Lands F, where illegal ROW trespass is being restricted, includes Covered Lands C and D2. Covered Lands D2, which involves restoration of wild blue lupine and nectar species along ROWs, will occur on Covered Lands D1 and D2. These areas of overlap are illustrated on the figures.

These mitigation measures, combined with the HCP's AMMs, will help to ensure that the amount of habitat for the Covered Species within the Covered Lands will not drop below the Baseline Survey habitat acreage of 34 acres and will help to create and promote additional habitat acreage in the Covered Lands. Table 4 provides an overview of the proposed mitigation and enhancement measures, with respective, potential acreage increases. References to relevant sections of the HCP that describe these measures are provided within the table.

Table 4: Summary of Obligations of National Grid

Covered Lands *Descriptions in Section 1.2.2*	**Figure Number** *See Appendix C Descriptions in Section 1.2.1*	**HCP Implementation Training/ Site Information**	**AMM Vegetation Management**	**AMM Other Covered Activities** *Funding - See Section 6.1.2*	**AMM Restricting Illegal Trespass** *Funding -See Section 6.1, Table 5*	**Mitigation /Enhancement** *Funding - See Sections 6.1, 6.2, and Table 5*	**Public Outreach** *Funding - See Sections 6.1, 6.2, and Table 5*	**Monitoring, Reporting, Adaptive Management** *Funding - See Sections 6.1, 6.2, and Table 5*	**Unforeseen Circumstances and Changed Circumstance**
<u>ROWs with Covered Species</u> Covered Lands: ROW with Covered Species Covered Lands A: Wild Blue Lupine Habitat Covered Lands B: 200-meter Buffer Area	Figures 3-15 ROWs with Red Hatch Figures 3-15 Incorporated into Covered Lands B Figures 3-15 See brown areas in ROWs – Covered Lands B	See Sections 4.2.1, 4.2.2, and 4.2.3	See Section 4.3.1 – all AMMs	See Section 4.3.2 – all AMMs	See Section 4.3.3	Wild blue lupine established due to mitigation/enhancement efforts and identified during survey becomes part of Covered Lands A (see 1.2.4) 200-m buffer around newly surveyed wild blue lupine becomes part of Covered Lands B (see 1.2.4)	See Section 4.3.3 a-d, w/focus on a-b	See Sections 1.2.4, 3.2, and 5.1 - 5.3; Wild blue lupine and Covered Species Surveys will be conducted in these areas. Responsibility of the NG Env. Mgr./Contract Biologists (4.2.2 [f]). For Covered Lands B, the location is estimated based on extent of Covered Lands A - Wild Blue Lupine Populations.	See Section 5.4 Does not apply to Covered Lands B.
<u>Mitigation</u> Covered Lands C: 5-acre preserve Covered Lands E: 23- Acre ROW	Covered Lands C: Figures 4, 17 & 19 Covered Lands E: Figure 13 and 16	See Sections 4.2.1, 4.2.2, and 4.2.3	See Section 4.3.1 – all AMMs	See Section 4.3.2 – all AMMs	See Section 4.3.3	<u>Mitigation</u> Covered Land C - See Section 4.4.1 Covered Land E – See Section 4.4.2		See Sections 1.2.4, 3.2, and 5.1 - 5.3; Wild blue lupine and Covered Species Surveys will be conducted in these areas. Responsibility of the NG Env. Mgr./Contract Biologists (4.2.2 [f]).	See Section 5.4
<u>Enhancement</u> Covered Lands D: ROW Translocate KBBs	Covered Lands D: Figures 4, 17, 18 & 20	See Sections 4.2.1, 4.2.2, and 4.2.3	See Section 4.3.1 – all AMMs	See Section 4.3.2 – all AMMs	See Section 4.3.3	<u>Enhancement</u> Covered Lands D – See Sections 4.5.1 and 4.5.2 Translocation KBBs - See Section 4.5.3	See Section 4.3.3 a-d, w/focus on a-b	See Sections 1.2.4, 3.2, and 5.1 - 5.3; Wild blue lupine and Covered Species Surveys will be conducted in these areas. Responsibility of the NG Env. Mgr./Contract Biologists (4.2.2 [f]).	See Section 5.4
<u>Restrict Illegal ROW Trespass</u> <u>Public Education/Outreach</u> Covered Lands F	Figure 20	See Sections 4.2.1, 4.2.2 and 4.2.3	Dependent on whether is ROW with Red or Blue Hatch	Dependent on whether is ROW with Red or Blue Hatch	See Section 4.3.3	Covered Lands F Overlap with Covered Lands D See Section 4.3.3	See Section 4.3.3 a-d, w/focus on a-b	See Sections 1.2.4, 3.2, and 5.1 - 5.3; Wild blue lupine and Covered Species Surveys will be conducted in these areas. Responsibility of the NG Env. Mgr./Contract Biologists (4.2.2 [f]).	Dependent on whether is ROW with Red or Blue Hatch
<u>Covered Lands - ROWs for Survey</u>	Figures 3-15 ROWs with Blue Hatch	See Sections 4.2.1, 4.2.2, and 4.2.3	Apply AMMs if wild blue lupine is observed in field.	Apply AMMs if wild blue lupine is observed in field.	Not priority activity unless trespass impacts Covered Lands with Habitat	Not Applicable. No mitigation/enhancement here	Not priority activity unless trespass impacts Covered Lands with Habitat	See Section 1.2.4 Surveys will be conducted for wild blue lupine. No presence/absence survey for KBB/FE unless wild blue lupine found	Not Applicable
<u>Covered Lands – Distribution Lines</u>	Figures 3-15 Area within green boundary; Figure 2, Green portion of 7 Quads with Green boundary	See Sections 4.2.1, 4.2.2, and 4.2.3	Apply AMMs if wild blue lupine is observed in field.	Apply AMMs if wild blue lupine is observed in field.	Not Applicable NG does not control ROW	Not Applicable No mitigation/enhancement here	None proposed on Distribution Lines/Easement	Not Applicable, No surveys will be conducted for this Covered Land category (see Section 1.2.4)	Not Applicable
Miscellaneous – Payment for Translocation of KBB and Providing Access. See Section 4.5.3 for an overview of this activity, and Section 6.1.8 for information on funding.									

5.0 MONITORING, REPORTING, AND ADAPTIVE MANAGEMENT PROGRAM

This section describes the monitoring, reporting, and adaptive management components of the HCP which are required as part of the Federal ESA Section 10 regulations. The goals of this program are to provide a basis for documenting HCP conformance and to continually evaluate and improve the effectiveness of the program, over time. Management and monitoring activities will address changing conditions, to improve conservation, and to evaluate the use and effectiveness of the monitoring data. The program will:

- document implementation of AMMs;
- document compliance with mitigation requirements;
- develop data and reporting strategies;
- evaluate effectiveness of mitigation measures; and
- identify methods for improving the program over time (Adaptive Management Program [AMP]).

Other Section 10 requirements, such as changed and unforeseen circumstances, and HCP amendments are also covered within this section. The scope of the monitoring and adaptive management program (AMP) is limited by the assurances provided by the USFWS and NYSDEC to NG and described in Section 5.4. These assurances include the commitment by the USFWS and NYSDEC that if unforeseen circumstances arise, NG will not be required to provide additional land and/or financial compensation.

5.1 Monitoring

5.1.1 Monitoring Compliance

Compliance monitoring will be completed to confirm that the terms of the HCP, ITP, and implementing agreement (IA) are being met. National Grid will monitor compliance with the biological goals and objectives, AMMs, and required mitigation measures through its own environmental personnel or through direct use of an environmental consultant. The monitoring will also help to identify any areas where continued education or training is necessary to meet the terms of the HCP. If necessary, the HCP administrator will provide additional training.

To ensure compliance, the HCP administrator will track and record the amount and locations of disturbances to the Covered Lands and document the mitigation acreage that is created. This information will be stored in a database maintained by National Grid Environmental Management Personnel. The database will periodically be reviewed to ensure proper documentation of the measures that were conducted. Each year, the database will be queried and these records will be reported in the annual HCP monitoring report.

5.1.2 Monitoring Effectiveness

National Grid will focus on monitoring the amount and quality of wild blue lupine habitat along the Covered Lands (excluding Distribution Lines/Easements) ROWs and will monitor changes in the adult populations of the Covered Species. Monitoring the status of existing wild blue lupine populations and

the restoration/mitigation areas will be important for determining the success of NG's conservation strategy.

Periodic surveys (every five years starting in 2012) during the life of the permit will be conducted to determine if conditions have changed in the previously surveyed wild blue lupine populations on the Covered Lands (excluding Distribution Lines/Easements), and to ensure that habitat within restoration/mitigation areas remains suitable for supporting healthy populations of the Covered Species.

These updates will be undertaken to identify locations and area coverage of wild blue lupine on NG electric and gas transmission lines and NG parcels within the following NY USGS quadrangles where wild blue lupine populations were previously observed in the 2006 Baseline Survey: Glens Falls, Gansevoort, Quaker Springs, Saratoga Springs, Round Lake, Rotterdam Junction, Schenectady, Niskayuna, Troy North, Albany, Voorheesville, Delmar and Verona. Distribution lines would not be surveyed. The purpose of the periodic survey is to identify where wild blue lupine populations have expanded or contracted in size.

The surveys will include updating the data based on any enhancement activities undertaken by NG within strategically selected ROW areas (see Section 4.4 of the HCP, which describes planting additional wild blue lupine on areas of NG ROW). The survey will also identify whether any wild blue lupine populations decreased in size since the previous survey. Any areas identified as containing wild blue lupine habitat during these subsequent surveys will become part of Covered Lands A and appropriate AMMs identified in Section 4.0 will be applied in the future. The wild blue lupine boundaries will be recorded using handheld GPS units. Revised boundaries will be delineated and stored as a GIS layer, and overlain onto the existing mapping data layers for each area. This method will enable NG to track changes in the aerial distribution of the existing habitat over five-year intervals. Survey protocol will follow the same protocol used in the 2006 Baseline Survey, see Appendix A.

Surveys of the Covered Species (i.e., presence/absence surveys) will be conducted every two years over Covered Lands A-Wild Blue Lupine Habitat, Covered Lands B – 200 meter Buffer Zone, and Covered Lands C, D, and E where wild blue lupine is present. The methodologies for the KBB and FE presence/absence surveys will be in accordance with the current USFWS and NYSDEC-accepted protocol for assessing KBB and FE populations. The current accepted protocol is the "Karner Blue Butterfly (*Lycaeides melissa samuelis*) Survey Protocols within the State of New York," prepared by the USFWS and NYSDEC in May 2008. National Grid proposes to conduct these surveys either through direct use of an environmental consultant or through arrangements made with a NGO. Monitoring data will be entered into a database and archived. The USFWS and NYSDEC will be allowed to inspect NG's monitoring records, as desired.

If results of the monitoring program indicate that KBB/FE populations are stable or increasing, NG will consult with the USFWS and NYSDEC to determine if the frequency of future KBB/FE surveys can be decreased.

Over the life of the permit, NG will develop strategies and formalize necessary protocols and procedures to incorporate experience-based knowledge into the monitoring program in an on-going effort to increase monitoring efficiency and data quality. National Grid will continually work with the USFWS, NYSDEC, and other organizations (e.g., local universities, TNC, APBPC) to exchange information that will improve the monitoring and adaptive management programs. National Grid is committed to a

monitoring program that uses the most current knowledge and best scientific techniques to maximize the effectiveness of its KBB/FE conservation strategy.

5.2 Reporting

National Grid will prepare and submit annual letter reports to the USFWS and NYSDEC, to provide information on the previous year's activities conducted in support of the HCP. The reports will be submitted to the USFWS and NYSDEC, no later than April 30th of the following calendar year. The information to be reported includes:

a. summarized results of all wild blue lupine and KBB/FE surveys on Covered Lands (excluding Distribution Lines/Easements) (to be conducted every five years and two years, respectively), including any locations where additional adaptive management tasks is completed in established mitigation areas. A summary table depicting changes in the size of wild blue lupine patches will be included;

b. a list of any surveyed wild blue lupine populations that were directly involved with any covered activities and a description of any known disturbances to the populations that occurred during completion of covered activities within or adjacent to these locations;

c. a list of any adaptive management recommendations NG feels may be required to improve the conservation strategies included in the HCP (see Section 5.3);

d. a summary of mitigation and enhancement measures implemented during the year. This may include the amount of wild blue lupine planted within Covered Lands C and E, number of devices installed to restrict illegal ROW trespass, and/or the status of public outreach and KBB translocation efforts. Information provided by the APBPC, TNC or other NGO within whom NG has established a conservation easement or similar cooperative agreement may also be provided; and

e. confirmation that funding is available or committed for the full implementation of the HCP for the ensuing year.

5.3 Adaptive Management Program

National Grid's AMP incorporates the four elements that the USFWS recommends for adaptive management strategies in HCPs: (1) identify uncertainties and the questions that need to be addressed to resolve uncertainties, (2) develop alternative strategies and determine which experimental strategies to implement, (3) integrate a monitoring program that is able to detect the necessary information for conservation-strategy evaluation, and (4) incorporate feedback loops that link implementation and monitoring to a decision-making process. The AMP will be a "learn by doing" process that, in conjunction with the monitoring program, will inform NG of the status of the Covered Species, so that management actions can be revised to meet the biological and conservation goals of the HCP.

5.3.1 Implementation

The AMP is a critical component of the HCP and it will be implemented by NG, in coordination with the USFWS and NYSDEC, with the support of all involved NGOs (i.e., APBPC and TNC), and with input from contributing environmental consultants. National Grid will consult with USFWS and NYSDEC biologists, in

proposing any adaptive management changes, and will seek their concurrences with same, before implementing them. The AMP will consist of the following activities:

a. evaluating monitoring data and results to support effective implementation of the HCP's conservation strategies;

b. assessing the effectiveness of established AMMs for minimizing impacts during covered vegetative maintenance and O&M activities and modifying or developing new AMMs, as appropriate; and

c. recommending changes to the approved conservation strategies of the HCP that may require modification of the USFWS ITP.

5.3.2 Addressing Uncertainty

In regards to HCPs, uncertainty typically refers to gaps in project background information, lacking precise knowledge of the biological requirements of the Covered Species, or having limited scientific information where it is difficult, or impossible, to predict the outcome of long term management activities. As post-disturbance surveys have not been conducted by NG or by the USFWS/NYSDEC, effects on the Covered Species or their associated habitat as a result of NG's utility activities are largely unknown. National Grid's monitoring program will provide greater certainty to tracking the number of covered activities that occur in the vicinity of wild blue lupine populations, the disturbance created by each activity, and the effectiveness of AMMs designed and implemented to minimize effects to the Covered Species. This data will be critical to the AMP.

The following are areas of uncertainty associated with NG activities: ATV minimization measure effectiveness, effectiveness of landowner outreach, and habitat restoration/management effectiveness (mitigation lands and Covered Lands A).

ATV minimization measure effectiveness: The goal of NG's ATV minimization measures is to avoid damage to KBB/FE from ATVs. If NG's efforts are insufficient, further responses are addressed in Section 5.4.1.

Landowner outreach effectiveness: The goal of landowner outreach is to avoid damage to KBB/FE from intrusions on NG ROWs. If NG's efforts are insufficient, further responses are addressed in Section 5.4.1.

Habitat restoration/management effectiveness: The goal of habitat restoration efforts on mitigation lands are to meet or exceed habitat parameters described as "Good" in TNC Viability Assessment Criteria (see Appendix G). If habitat parameters are not met (e.g., weather conditions affected seed germination rates), NG will continue to manage mitigation areas until the parameters are met. This may include replanting wild blue lupine seed, nectar plant seed or seedlings, application of herbicide to invasive species, etc.

The goal of habitat efforts for Covered Lands A is to maintain and expand this area within the Covered Lands. If the acreage of Covered Lands A drops below 34 acres, NG will restore habitat back to at least 34 acres.

If declines greater than 25 percent in KBB/FE populations are identified within the Covered Lands, during biennial surveys, NG will consult with the USFWS and NYSDEC to analyze data obtained by the

monitoring program. Only declines greater than 25% will be identified because detecting smaller declines in KBB/FE populations is difficult due to the complexity of locating all KBB/FE and the variability of population sizes from year to year. It should be noted that declines in small, isolated wild blue lupine populations outside of the Albany Pine Bush and Queensbury viable KBB/FE population areas will be identified; however, the focus will be on conserving and restoring populations within these priority areas. This data will be compared with recent literature and research to elucidate potential causes of the decline and to evaluate if changes to the HCP's conservation strategies and associated AMMs are appropriate.

If downward trends in wild blue lupine population and KBB/FE populations continue after implementing these modifications, consultations with the USFWS and NYSDEC will be conducted to determine if the monitoring program needs to be intensified (e.g., expand monitoring activities following covered activities, etc.) or if AMMs and the conservation strategy need to be further modified. If declines persist, NG will cooperate with the USFWS and NYSDEC to determine what additional actions may need to be implemented on the Covered Lands.

5.4 Overview of Changed and Unforeseen Circumstances

As part of the federal Endangered Species Act regulations, 50 CFR Sections 17.22(b)(2) and 17.32(b)(2),the HCP must specify the procedures that will be followed in the event of a changed and unforeseen circumstances that may arise during the implementation of the HCP. "Changed circumstances" is defined to mean changes in circumstances affecting the Covered Species (KBB and FE) that can reasonably be anticipated by NG and the USFWS/NYSDEC and that can reasonably be planned for (i.e., the listing of a new species, or a fire or other natural catastrophic event in areas prone to such events). "Unforeseen circumstances" is defined to mean changes in circumstances affecting the Covered Species that could not reasonably have been anticipated by NG and the USFWS/NYSDEC at the time of the HCP's negotiation and development, and that result in a substantial and adverse change in the status of the Covered Species. Unforeseen circumstances would include natural disasters of a scale or magnitude not anticipated under normal circumstances.

5.4.1 Specific Changed Circumstances - Vandalism

New or future acts of vandalism or other destructive, illegal human activities are considered changed circumstances. Damage to or destruction of utility facilities and associated ROWs, as a result of illegal ATV trespasses, illegal dumping or other unauthorized activities, are considered vandalism.

A history of prior occurrences indicates that the illegal activities listed above are relatively common within specific sections of the Covered Lands. However, the installation of access restrictions such as gates, fencing, and boulders at strategically-selected ROW areas, are included as proposed mitigation strategies to help ensure that these events are minimized. Although these events are relatively common within the Covered Lands, historical events have been small in size and effect. Historically, the size of vandalism events have been small (estimated at less than ¼ acre) and the potential occurrence of larger scale destructive events is very low.

If one of these circumstances occurs within the Covered Lands A, B, C, D or E and impacts are suspected to the Covered Species, NG will determine the extent of damage and notify the USFWS and NYSDEC within 5 business days of discovering the vandalism or illegal activity. National Grid will then identify and

implement an appropriate response, including seeking performance or redress by any responsible third party if practical, in concurrence with the USFWS, NYSDEC, and the involved enforcement authorities.

Appropriate responses include:

- Increased landowner outreach (personal visits),
- Increased signage placed on site
- Increased security patrols of ROWs and additional enforcement efforts,
- Installation of additional barriers (see Section 4.3),
- Use of new types of restrictive devices, and
- Restoration of disturbed areas (see Section 4.5.2)

5.4.2 Specific Changed Circumstances - Invasive Species

Undesirable and/or invasive plant species that have been documented at existing Covered Species sites in New York include poison ivy, black locust, scrub oak, and non-native grasses. Over the life of the permit, it is reasonable to expect that nonnative plant and/or animal species could be introduced into the Covered Lands and that these introduced species could reduce or adversely affect the quality of habitat for the Covered Species. The following actions will be taken:

In the event that the uncontrolled spread of invasive species cause the Covered Lands A to fall below 34 acres, additional management efforts are required.

Mitigation areas will be monitored on a bi-annual basis and invasive species will be noted within Covered Lands C, D, and E. If it appears uncontrolled (greater than 10% change in aerial over baseline survey areas) has occurred, NG will evaluate and identify the proper corrective actions to initiate after consultation with the USFWS/NYSDEC.

Appropriate responses include:

- Herbicidal applications (Basal, Stump, and Foliar Applications)
- Mechanical removal
- Non-herbicide mechanical vegetation management methods (hand cutting)

Thus, any impacts to the Covered Species that occur as a result of colonization by invasive species, and that cannot be effectively controlled by USFWS or NYSDEC approved methods or technologies, will be considered unforeseen circumstances.

5.4.3 Specific Changed Circumstances - New Species Listing

This specific changed circumstance applies to both Covered and Non-Covered Species.

Frosted elfins are currently not listed as a federally endangered or threatened species; however, they may become listed during the anticipated 50-year life of the permit and a recovery plan may be developed for the species. If the Frosted Elfin, which is addressed within this HCP as a Covered Species,

is listed following the issuance of the HCP's associated Section 10(a)(1)(B) permit, no action will be required of NG under the ESA and NG will automatically be covered for take.

Any species that are not addressed as a Covered Species in this HCP and that are subsequently listed will not be covered under the ITP, without an officially-issued amendment to accomplish same. The USFWS and NYSDEC may notify NG of potential listings of species not covered by the HCP but that could be affected by their activities. National Grid may enter into negotiations with the USFWS regarding necessary modifications, if any, to the HCP to revise or amend the ITP to cover the newly listed species. In concurrence with the USFWS and NYSDEC, NG will identify appropriate measures to avoid the likelihood of take to the uncovered species. The USFWS and NYSDEC will take into account conservation and mitigation measures already provided in the HCP. If requested, NG will attempt to implement new BMPs and AMMs until such time as NG's federal permit is amended to obtain coverage for the newly listed species.

5.4.4 Specific Changed Circumstances - Fire/Windstorm/Ice Storm/Tornado

Two other changed circumstances are accidental fires or downed trees caused by large-scale windstorms, ice storms, or tornados. However, the probability is very low of these events occurring with the Covered Lands. First, numerically, the incidence of fire, windstorm and tornado are very low in the geographic region, and second, since these ROWs are being maintained to reduce tree cover, and thus enhance wild blue lupine and nectar species, the adverse impacts from fire, windstorms, tornados and ice storms are reduced on the ROWs where this HCP is being implemented, especially in Covered Lands C, D, E where the main wild blue lupine plantings are to be located, and where the mitigation plan is focused. Nevertheless, if any of these events take place and disturbances to the Covered Species or Covered Lands occur, NG will determine the extent of damage and notify the USFWS and NYSDEC within 5 business days. In the event that the fire, windstorm, tornado, ice storm cause the Covered Lands A to fall below 34 acres, additional management efforts are required.

5.4.5 Specific Changed Circumstances - Labor Dispute

In the event of a labor dispute, there may be the need to delay routine maintenance such as fall/winter cutting to restore open sunshine onto areas of wild blue lupine. This delay should not have a significant impact on wild blue lupine populations as the routine maintenance would be on-going and could be put off for a year without significant shading to plants. It is highly unlikely that a labor dispute would last for more than a year. For delays in implementation of HCP requirements caused by labor disputes, we do not anticipate any additional response from NG except to coordinate with USFWS and NYSDEC because of minor/insignificant biological consequences. With regard to any potential use of contractors, as stated in Section 2.1.2, contractors are held to the same requirements as NG employees to comply with NG's EG documents and this HCP, and no additional take is anticipated.

5.4.6 Specific Changed Circumstances - Actions of Non-Participating Agencies

Actions of non-participating agencies could include activities of emergency personnel, such as firefighters, state agencies, and other life and safety personnel operating on the ROW as part of an emergency response. They could also include electrical crews brought in from other parts of the state or country to respond to a significant natural event described in 5.4.4. The same process as identified in Section 5.4.4 would be followed if non-participating agencies caused damage to Covered Species or

Covered Lands as a result of an emergency response. This could include seeking performance or redress by any responsible third party as described in Section 5.4.1.

Non-participating agencies can also include activities of adjacent landowners that may accidentally mow into the ROW in locations of wild blue lupine and/or nectar species. When these conditions are observed, the procedures identified at 5.4.1 will be followed.

5.4.7 Unforeseen Circumstances - Floods

By definition, unforeseen circumstances are those that could not be have been reasonably anticipated. Thus the only unforeseen circumstance that might be relevant to this HCP is flooding. Floods are natural events that could have a significant impact on the Covered Species and their associated habitat. However, a flood affecting the Covered Species within the Covered Lands is not anticipated to occur as most of the surveyed wild blue lupine populations are not located near riparian areas. Any flooding events that cause substantial and adverse impacts to the Covered Species will be considered an unforeseen circumstance. In case of such an unforeseen circumstance, NG will notify the USFWS and NYSDEC as soon as practical after discovery of such circumstance.

5.4.8 Response to Unforeseen Circumstances

In case of an unforeseen circumstance, NG will notify the USFWS and NYSDEC as soon practical after discovery of the circumstance. If the USFWS or NYSDEC determines that an unforeseen circumstance has occurred, the USFWS will provide written notice to NG detailing the facts regarding the unforeseen circumstance involved, the anticipated impact on the Covered Species, proposed mitigation measures that are believed to be necessary, and any information or data used to support the determination. Other supplementary information that will be included in the notice includes an estimate of the cost of implementing the new conservation measures and the likely effects on the implementation and success of the HCP.

It will be the responsibility of the USFWS to demonstrate that an unforeseen circumstance has occurred. Moreover, under the HCP "No Surprise" Rule (63 Federal Register 8859, February 23, 1998), NG cannot be held responsible for bearing any additional economic burden to respond to unforeseen circumstances as long as it is complying with its HCP obligations. It is the responsibility of the USFWS to pay for such conservation and mitigation actions. However, NG will attempt, to work with the USFWS to see if there are ways to increase the effectiveness of NG's conservation measures under this HCP to address unforeseen circumstances without increasing NG's financial obligations.

5.5 Revisions and Amendments

National Grid may need to revise the HCP or ITP to address activities not anticipated during the life of the ITP or to clarify requirements of the HCP. These revisions can take the form of either minor or major amendments. Any amendment will be in accordance with applicable legal requirements, and all revisions will be circulated to the USFWS and NYSDEC. Because the HCP is being used to satisfy ESA and ECL permit requirements the HCP may be amended only with the written consent of NG, USFWS, and the NYSDEC.

5.5.1 Minor Amendments

Minor amendments are those that do not require any additional take analysis or authorization. Minor amendments to the ITP and HCP may include but are not limited to the following:

- Correction of typographical, grammatical, and similar editing errors in the HCP that do not change the intended meaning;
- Correction of any maps or exhibits to correct errors in mapping;
- Minor changes to monitoring or reporting protocols;
- Changing any measure(s) in the conservation strategy to respond to a changed circumstance as currently agreed upon in the HCP; and
- Correction of any tables or appendices in the HCP to reflect previously approved amendments to the HCP, if applicable.
- Changes to maps of Covered Lands that reflect geographic shifts of Covered Lands A and B (within red hatched ROWs) over time. The wild blue lupine patches and associated nectar/grass buffer areas will continue to be protected as Covered Lands A and B; however, their geographic location may shift. For example, consolidation of wild blue lupine populations in the Queensbury area.
- Changes to maps and description of Covered Lands associated with new information (e.g., 5-year surveys) allowing for an increase of up to 50 additional acres of occupied wild blue lupine in the Covered Lands.
- Removal of ROWs (blue hatched) if wild blue lupine is not found during two consecutive surveys (10 years) of these ROWs.

National Grid, the USFWS, or the NYSDEC may propose a minor amendment to the ITP or HCP by providing written notice to all involved parties (i.e., NG, USFWS, and NYSDEC). Such notice will include a statement of the reason for the proposed amendment and an analysis of its environmental effects; if any, including any effects on covered activities and on Covered Species and any other information required by law. The Parties will respond in writing to the proposed amendment, within sixty (60) days of receipt of such notice.

The USFWS may object to a proposed minor amendment by providing a written statement that such amendment would not meet the requirements of Section 10(a)(2)(B) of the ESA. The NYSDEC may similarly object to a minor amendment if it does not meet requirements of ECL. The USFWS or NYSDEC may not approve a minor amendment that results in adverse effects on the environment or additional take not analyzed in association with the HCP. Where possible, the USFWS and NYSDEC will first consult with NG before rejecting a proposed minor amendment. During the consultation, the USFWS and NYSDEC will suggest reasonable conditions or alterations to the proposal which, if agreed to by NG, would permit the USFWS and NYSDEC to approve the proposed amendment. National Grid may object to a proposed minor amendment upon any reasonable basis. If a minor proposed amendment is rejected by the USFWS or NYSDEC and is not resolved by any conditions or alterations, the proposed amendment will be processed as a major amendment. Minor amendments do not require additional public comment.

5.5.2 Major Amendments

Any changes to the ITP and HCP that do not qualify as a minor amendment will be processed as a major amendment in accordance with all applicable laws and regulations, including but not limited to the ESA and NEPA. Similar to a minor amendment, the party proposing the major amendment will provide a written statement of the reasons for the amendment and an analysis of its environmental effects, including any on the covered activities or species. Where possible, the USFWS and NYSDEC will process the proposal within one hundred eighty (180) days of receipt of the application, except where longer times are required by law. National Grid may, at its sole discretion, reject any major amendment proposed by the USFWS or NYSDEC. Major amendments would likely require a new public comment period.

5.5.3 New Activities

National Grid does not expect that the covered activities described in this HCP will materially change during the term of the ITP. To the extent that any materially new or different activities are proposed to be conducted on the Covered Lands A, B, C, D and E, NG will propose an amendment to the ITP to authorize such activities.

5.5.4 Suspension/Revocation of Permit

The USFWS may suspend or revoke the ITP if NG fails to implement the HCP in accordance with the terms and conditions of the permit or if suspension or revocation is otherwise required by law. Suspension or revocation of the Section 10(a)(1)(B) permit, in whole or in part, by the USFWS shall be in accordance with 50 CFR 13.27-29, 17.32 (b)(8).

6.0 FUNDING

This chapter provides an overview of the estimated cost of implementing the HCP and the source of funding for each component of the project (i.e., monitoring, reporting, mitigation, etc.). The estimated funding is based upon NG's analysis of their projected costs for implementing the terms of the ITP. The general assumptions and estimates are provided below. Table 5, Projected HCP Costs, provides an overview of all of the costs associated with the HCP.

6.1 Implementation of the HCP

Plan implementation costs include the direct and indirect costs associated with the conservation strategy, the management program, and the monitoring program. Additional costs include staff educational training expenses associated with Plan administration. The startup costs to implement this HCP are estimated at $229,000. The estimated annual cost for the implementation of this HCP varies from approximately $56,935 (for years that do not include periodic wild blue lupine and/or butterfly surveys) to up to approximately $126,935 (for years that include both periodic wild blue lupine and butterfly surveys). The total cost over the anticipated 50-year permit term is estimated at $5,979,200, assuming 1.5% annual inflation (see Table 5). The actual costs over time may actually be more or less than those projected in this HCP. Therefore, the total cost should be regarded as a planning-level estimate to determine the appropriate amount of funding that is likely necessary to implement the HCP. These costs are divided into four categories:

- HCP Administration and Training
- Habitat Restoration, Mitigation and Management
- Monitoring, Reporting, and Adaptive Management
- Other Program Costs (Public Outreach, Miscellaneous Costs, etc.)

6.1.1 HCP Administration and Training

Upon acceptance of this HCP by the USFWS, NG will implement the conservation strategy which includes an annual environmental awareness training program for NG field personnel. As a training program is already being implemented by NG, additional training costs should be limited to future, minor updating of training materials and staff support of any special training sessions. Over the anticipated 50-year duration of the ITP, HCP costs are anticipated for the following needs:

- HCP administration labor (for coordination, adaptive management, agency meetings, record-keeping and data management);
- staff labor to attend and support special training sessions (for contractors or special projects); and
- updates to training materials.

The startup costs associated with HCP administration tasks and training are estimated at $14,500. The annual estimated costs are $12,000, and the total cost over the 50-year permit term is estimated at $898,694 (see Table 5).

6.1.2 Implementation of AMMs

Enhanced AMMs are an integral part of the conservation strategy employed in the HCP. National Grid's current vegetative management and O&M activities already adhere to a significant portion of the AMMs proposed within this HCP. However, implementation of several new measures (i.e., installation of access barriers at selected sites to prevent illegal ROW trespass) will result in additional costs to NG. In addition, new signage will be erected at surveyed ROW habitat locations. The startup costs associated with implementation of AMMs are estimated at $5,000. Please note that the costs associated with the installation of access barriers are discussed below in Section 6.1.5. The annual estimated costs are $2,500, and the total cost over the 50-year permit term is estimated at $189,207.

6.1.3 Estimated Costs to Develop ROW Habitat Adjacent to the Albany Pine Bush Preserve

Through a contractual arrangement with the APBPC, NG will provide financial payment for services, access rights and management rights to the APBPC, to develop and manage up to 23 acres of habitat on a fee-owned ROW located adjacent to the Albany Pine Bush Preserve. National Grid will provide the APBPC with a one time, $50,000 payment during the first year of the HCP implementation. There will be no annual costs associated with this mitigation and enhancement measure.

6.1.4 Estimated Costs to Conduct Enhanced ROW Vegetation Maintenance Program

In an effort to promote KBB/FE habitat on affected ROWs within the Covered Lands, NG has proposed to modify their vegetation management program along several segments of a strategically-selected ROW

located in the Town of Queensbury, Warren County area, within the GLARU. Modification of the vegetation management program to remove woody shrubs and low-growing trees, in addition to the tall-growing tree species that are normally removed, will require a small increase in labor and material costs. The estimated startup cost for modifying the existing vegetation management program is $5,000. The annual estimated costs are $5,000, and the total costs over the 50-year permit term are estimated at $373,414.

6.1.5 Estimated Costs Associated with the Restriction of Illegal ROW Trespass

National Grid will place restrictive devices such as boulders, gates, and barriers at major ATV access points or routes along the Spier-Queensbury #5 – Ogden Brook Tap 115kV ROW. See Figure 20, Restriction of Illegal ROW Trespass. National Grid will also contact private landowners along the ATV usage areas and advise them of NG's zero-tolerance policy for ROW trespass. In addition, NG proposes to specifically target known illegal lawn waste dumping areas identified by the NYSDEC at the Queensbury-Henry St. #14 34.5kV ROW and an approximately 1-mile segment of the Spier-Queensbury #17/5 115kV ROW running east-west and crossing Dixon Road in the Town of Queensbury, Warren County. Startup costs associated with installing restrictive devices (i.e., materials and labor) are estimated at $50,000. The annual estimated costs are $5,000 and the total cost over the 50-year permit term is estimated at $418,414.

6.1.6 Estimated Costs to Conduct Specialized Site Restoration/Habitat Management

National Grid will restore some onsite impact areas through planting a nectar/wild blue lupine seed mix at disturbance sites and areas where illegal trespassing (e.g., ATV paths within ROWs) has occurred. Estimated startup costs associated with materials and supplies are $25,000. The annual estimated costs are $10,000, and the total costs over the 50-year permit term are estimated at $761,828.

6.1.7 Estimated Costs for the Establishment of an Off-ROW KBB/FE Preserve

National Grid has proposed to establish a 5-acre off-ROW preserve within a 24.67-acre parcel of property that it owns in the Town of Queensbury, Warren County, New York (Covered Lands C). The estimated market value of dedicating this 5-acre area for an off-ROW preserve is approximately $80,000. As part of the site preparation activities, NG will selectively clear and remove undesirable tree species from about 1.25 acres of the forested portion of the preserve, and wild blue lupine and other native nectar species will be planted within the dedicated preserve area. The startup costs associated with establishing an off-ROW preserve are estimated at $40,000. The annual estimated costs are $2,085, and the total costs over the 50-year permit term are estimated at $193,683.

6.1.8 Estimated Costs Associated with the Translocation of Karner Blue Butterflies

National Grid has proposed to support a five year KBB translocation program in the Town of Queensbury, Warren County. As part of the translocation program, NG will contract with the APBPC for these services, to include hiring an intern, to facilitate the translocation of KBBs. A one-time contractual payment of $15,000 will be paid to the APBPC, to hire an intern, for three summers. NG will also provide a one time, $5,000 contractual payment to the Town of Queensbury or NYSDEC or APBPC for habitat management services at the candidate release site, for the translocation efforts. NG's startup costs

associated with coordinating with the APBPC and the NYSDEC are estimated at $5,000. The total estimated costs for this task are $32,568.

6.1.9 Estimated Costs Associated with Conducting Public Outreach

National Grid will incur labor and expense costs for conducting outreach and awareness efforts with adjacent landowners, ATV clubs, local police, and local media. The estimated startup costs include materials and legal fees concerning coordination with law enforcement. It is estimated that startup costs will be approximately $5,000. The annual estimated costs are $1,000 and the total costs over the 50-year permit term are estimated at $78,683.

6.1.10 Monitoring, Reporting, and Adaptive Management

A monitoring program is required as part of the HCP and will be integral to the AMP. Estimated costs associated with the proposed monitoring program are based upon the anticipated number of surveys and upon the cost of the 2006 Baseline Survey. This HCP assumes that surveys of the existing wild blue lupine populations will be conducted every five years, and surveys of the Covered Species will be conducted every two years. Results of these surveying efforts will be summarized in an annual letter report to the USFWS and NYSDEC.

Under the previous permit (in effect for 12 years), NG submitted an annual letter report to the USFWS and NYSDEC. Therefore, a significant increase in funding needed for preparing a similar annual letter report is not anticipated. Costs associated with the AMP are largely unknown at this time. For that reason, NG will assume that $7,500 may be incurred during the first year of the HCP's implementation, for these efforts. Once a better estimate of the amount of funding needed to comply with the AMP is determined; the necessary amount of funding will be incorporated into the annual budget. The total costs associated with the surveys and reporting are estimated at $2,096,515.

6.1.11 Other Plan Costs

National Grid is also anticipating that an increase in funding will be necessary for increasing its own security patrols and to support the USFWS and NYSDEC environmental enforcement actions and local law enforcement efforts to prosecute illegal ATV and other types of trespass upon NG land and ROWs. An increase in these potential NG Security-related efforts will also require some additional funding. Startup costs associated with this task are estimated at $2,000. The annual costs are estimated at $12,000 and the total costs over the 50-year permit term are estimated at $886,194.

Table 5: Projected HCP Costs

Activity	Startup Costs	Annual Costs*	Periodic Costs	Total Costs**
NG HCP Administration and Training (Described in Section 4.2)				
Record Keeping and Data Management	--	$2,500	--	$184,207
Training Program	$2,500	$2,000	--	$149,866
Special Training and Seminars	$2,000	$2,500	--	$186,207
HCP Legal Review	$10,000	$5,000	--	$378,414
Subtotal	**$14,500**	**$12,000**	**--**	**$898,694**
Avoidance and Minimization Measures (Described in Section 4.3)				
Implement new AMMs	$5,000	$2,500	--	$189,207
Subtotal	**$5,000**	**$2,500**	**--**	**$189,207**
Covered Lands E - Develop Right-of-Way Habitat Management Adjacent to the APBPC (Described in Section 4.4.2)				
Contract with the APBPC to provide vegetation maintenance and habitat management services	$50,000	--	--	$50,000
Subtotal	**$50,000**	**--**	**--**	**$50,000**
Covered Lands D1 - Conduct Enhanced ROW Vegetation Maintenance (Described in Section 4.5.1)				
Modifications to Existing Program	$5,000	$5,000	--	$373,414
Subtotal	**$5,000**	**$5,000**	**--**	**$373,414**
Covered Lands F - Restriction of Illegal ROW Trespass (Described in Section 4.3.3)				
Install Barriers, Gates, Restrictive Devices	$50,000	$5,000	--	$418,414
Subtotal	**$50,000**	**$5,000**	**--**	**$418,414**
Covered Lands D1 and D2 - Conduct Specialized Site Restoration/Habitat Management (Described in Sections 4.5.1 and 4.5.2)				
Restore Covered Activity-Disturbed Work Sites	$5,000	$5,000	--	$373,414
Conduct Restoration of Trespass Areas	$20,000	$5,000	--	$388,414
Subtotal	**$25,000**	**$10,000**	**--**	**$761,828**
Covered Lands C - Establish an Off-ROW KBB/FE Preserve (Described in Section 4.4.1)				
Site Development/Preparation (Cutting and Hauling)	$35,000	--	--	$35,000
Habitat Management	$5,000	$1,000	--	$78,683
Loss of Usage Rights within 5-acre Preserve	--	$1,085	--	$80,000
Subtotal	**$40,000**	**$2,085**	**--**	**$193,683**
Translocation of KBBs (Described in Section 4.5.3)				
Contract with the APBPC for Intern/Temporary Worker to Implement KBB Transplantation Efforts	$15,000	--	--	$15,000
Contract with the Town of Queensbury and/or NYSDEC for Habitat Management Activities	$5,000	--	--	$5,000
Coordination with APBPC and NYSDEC (5 years total)	$5,000	$1,850	--	$12,568
Subtotal	**$25,000**	**$1,850**	**--**	**$32,568**
Conduct Public Outreach (Described in Section 4.3.3)				
Letters/Mailings to Adjacent Landowners, etc.	$5,000	$1,000	--	$78,683
Subtotal	**$5,000**	**$1,000**	**--**	**$78,683**
Monitoring, Reporting, and Adaptive Management Program (Described in Section 5.0)				
Wild Blue Lupine Surveys (every 5 years)	--	--	$50,000	$952,417
KBB/FE Surveys (every 2 years)	--	--	$20,000	$731,343
Annual Letter Report to Regulatory Agencies	--	$3,000	--	$221,048
Adaptive Management Program/Research	$7,500	$2,500	--	$191,707
Subtotal	**$7,500**	**$5,500**	**$70,000**	**$2,096,515**
Other Plan Costs				
Coordination with Enforcement Actions	$1,000	$10,000	--	$737,828
NG Security-related Efforts	$1,000	$2,000	--	$148,366
Subtotal	**$2,000**	**$12,000**	**--**	**$886,194**
Total	**$229,000**	**$56,935**	**$70,000**	**$5,979,200**

* The estimated annual cost will vary from approximately $56,935 during years that do not include wild blue lupine and/or KBB/FE surveys up to approximately $126,935 during years that include both wild blue lupine and KBB/FE survey work.

** Total cost= startup costs + (annual cost with 1.5% estimated inflation rate x 50 year ITP term. Actual future costs may vary somewhat from these estimates due to changes in economic factors such as labor rates, that cannot be accurately predicted over 50 year period)

6.2 Adequacy of Funding

National Grid is able to fund all costs of the HCP, including implementation, mitigation, and monitoring costs. National Grid attests to this commitment in the letter attached in Appendix F, Funding Commitment Letter. Costs associated with compliance with the HCP guidelines will be funded annually through NG's O&M budgets and through funds paid by NG's gas and electric customers. Collection of customer funds is authorized by the New York State Public Service Commission (NYPSC) for ongoing O&M activities. If for any reason during the implementation of the HCP, funding appears to be unavailable to meet commitments, NG will contact the USFWS to determine whether an amendment to the HCP is necessary.

7.0 ALTERNATIVE ANALYSIS

This plan will be implemented on the NG electric and gas ROWs identified as Covered Lands in this HCP (See HCP Section 1.2). As stated in Section 2.3, over the duration of the ITP, NG will periodically rebuild and refurbish its existing electric and natural gas infrastructure within the Covered Lands. New electric and natural gas facilities will be occasionally installed and constructed in the Covered Lands, as needed to support effective and reliable energy delivery to NG customers, over the duration of the ITP. This plan will also provide coverage for these new construction activities and any new ROWs. Routine O&M activities, improvements, and emergency work will continue to take place at times on the Covered Lands and throughout the ITP's proposed duration of 50 years. Under Section 10 of the ESA, permit applicants are required to specify in the HCP which alternative actions to the taking of federally listed species were considered and the reasons why those alternatives were not selected.

7.1 Description of Alternatives

Two alternatives to continuing the covered activities were considered and eliminated due to their conflict with NG's obligation to deliver safe, reliable and cost-effective energy to its customers. These alternatives and the rationale for their elimination from further consideration are discussed below.

7.1.1 No-Action Alternative

Under this alternative, NG would cease all covered activities along the Covered Lands. Cessation of these activities would avoid or significantly reduce the likelihood of causing the incidental take of the Covered Species.

This alternative is not feasible, since the facilities and ROWs need to continue to be operated and maintained to provide the safe, reliable and cost-effective delivery of energy to NG's customers. Implementation of this alternative would eventually cause the existing facilities to deteriorate and fail. It would allow for the unrestricted growth of incompatible vegetation within the ROWs and an increase in the number of danger and hazard trees along ROWs. Unrestricted growth of incompatible vegetation would have a long-term, negative impact on the Covered Species because low-growing suitable nectar habitat would be replaced by tall-growing vegetation, which would shade the wild blue lupine and other nectar plants and cause the populations to decline. This alternative would negatively impact utility service to NG customers, as more power outages would likely occur as incompatible vegetation and danger/hazard trees would grow in close proximity to the transmission infrastructure, and as the existing facilities failed to operate due to tree-related outages, storm damage, vandalism, aging and deterioration of equipment. Cessation of the covered activities is not a viable alternative.

7.1.2 Modifying/Eliminating O&M Activities

Modifying or delaying the performance of the covered activities beyond what the HCP's AMMs will achieve, in order to avoid or further reduce the likelihood of incidental take of the Covered Species, poses unacceptable risks to NG's ability to provide its customers with the safe, reliable and cost-effective delivery of energy. This alternative is therefore not deemed to be a viable alternative.

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Appendix A:
2006 Wild Blue Lupine Survey Report

Appendix B:
Tables

Table 1: Surveyed Electrical ROWs within the Covered Lands That Contained Wild Blue Lupine Populations

Label	USGS 7.5' Quadrangle	County	Electrical Transmission Line	Ownership Status	Voltage (kV)	Typical ROW width (ft)	Lupine Population Size (Acres)
AB21	Albany	Albany	McKownville - Patroon 6	Easement	115	100	0.094844
GF59 - GF62	Glens Falls	Warren	Spier-Queensbury #5 - Ogden Brook Tap	Easement, Fee-owned	115	75	0.5033
GF60c	Glens Falls	Warren	S-Q 5 - Ogden Brook Tap	Easement	115	75	0.00309
RL26	Round Lake	Saratoga	Ballston - Mechanicville 6	Easement	34.5	100 (V, CL)	0.150024
RL27	Round Lake	Saratoga	Ballston - Mechanicville 6	Easement	34.5	100 (V, CL)	1.661575
RL28	Round Lake	Saratoga	Ballston - Mechanicville 6	Easement	34.5	100 (V, CL)	0.003091
SS37	Saratoga Springs	Saratoga	Saratoga- Ballston 10 / Gen Foods Tap	Easement	34.5	50-75 (CL)	1.87126
SS36ab	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Easement	34.5	50-75 (CL)	0.341811
SS36b	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Easement	34.5	50-75 (CL)	3.036734
SS38	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Easement	34.5	50-75 (CL)	1.436173
SS93	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Easement	34.5	50-75 (CL)	0.139528
SS35/ SS36a	Saratoga Springs	Saratoga	Spier-Ballston 11; South St. Tap	Easement	34.5	50-100 (V, CL)	5.227359
RL81**	Round Lake	Saratoga	Ballston - Mechanicville 6	Easement	34.5	100 (V, CL)	0.008737
RL82**	Round Lake	Saratoga	Ballston - Mechanicville 6	Easement	34.5	100 (V, CL)	0.028207
SS31	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Easement	34.5	50-75 (CL)	0.001481
SS34	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Easement	34.5	50-75 (CL)	0.049896
SS74**	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Easement	34.5	50-75 (CL)	0.009715
SS33	Saratoga Springs	Saratoga	S-R 1 - Weibel Ave Tap	Easement	115	75	0.005442
TN10a	Troy North	Saratoga	Rotterdam-Bear Swamp E205	Easement	230	150	0.08805
TN10b	Troy North	Saratoga	Rotterdam-Bear Swamp E205	Easement	230	150	0.026641
AB20	Albany	Albany	Karner-Patroon 5	Fee-Owned	34.5	150 (V, CL)	0.00666
AB22	Albany	Albany	Karner-Patroon 5	Fee-Owned	34.5	150 (V, CL)	0.005596
AB23	Albany	Albany	McKownville - Krumkill 8	Fee-Owned	115	100	0.258148
DM86**	Delmar	Albany	Reynolds Road - Feura Bush 17	Fee-Owned	115	50-250	0.120945
GS73**	Gansevoort	Saratoga	Spier - Mohican 7	Fee-Owned	115	100-125	0.053605
GS74**	Gansevoort	Saratoga	Spier - Mohican 7	Fee-Owned	115	100-125	0.007955

Label	USGS 7.5' Quadrangle	County	Electrical Transmission Line	Ownership Status	Voltage (kV)	Typical ROW width (ft)	Lupine Population Size (Acres)
GS104	Gansevoort	Saratoga	Spier-Glens Falls 8	Fee-Owned	34.5	100	0.008647
GS105	Gansevoort	Saratoga	Spier-Glens Falls 8	Fee-Owned	34.5	100	0.006409
GF47	Glens Falls	Saratoga	Ballston - Mechanicville 6	Fee-Owned	34.5	100 (V, CL)	0.046986
GF48a	Glens Falls	Saratoga	Ballston - Mechanicville 6	Fee-Owned	34.5	100 (V, CL)	0.001249
GF46b	Glens Falls	Saratoga	Mohican - Butler 18	Fee-Owned	115	100	0.142755
GF46a	Glens Falls	Saratoga	Mohican - Butler 18	Fee-Owned	115	100	0.056338
GF69	Glens Falls	Saratoga	Mohican - Butler 18	Fee-Owned	115	100	0.027914
GF57a	Glens Falls	Warren	Queensbury-Henry St 14/Town of Queensbury Water pipeline-related Easement	Fee-Owned	34.5	75 (V, CL)	0.038968
GF57b	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.036999
GF57c	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.06035
GF57d	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.174998
GF57e	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.114962
GF57f	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.000772
GF57g	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.057119
GF57h	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.023283
GF57i	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.0000298
GF57j	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.0000294
GF57k	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.000772
GF57l	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.0000292
GF58a	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.092621
GF58b	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.008399
GF58c	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.125257
GF58d	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.049134
GF58e	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.025013
GF58f	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.12598
GF58g	Glens Falls	Warren	Queensbury-Henry St 14/TOQ Easement	Fee-Owned	34.5	75 (V, CL)	0.0000294
GF54	Glens Falls	Saratoga	Spier - Mohican 7	Fee-Owned	115	100-125	0.011973
GF56a	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.00195
GF56b	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.000191

Label	USGS 7.5' Quadrangle	County	Electrical Transmission Line	Ownership Status	Voltage (kV)	Typical ROW width (ft)	Lupine Population Size (Acres)
GF56c	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.00019
GF56d	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.01803
GF56e	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.001965
GF56f	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.004568
GF56g	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.001657
GF56h	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.022827
GF60b	Glens Falls	Warren	S-Q 5 - Ogden Brook Tap	Fee-owned	115	75	0.000773
GF62a	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.015094
GF62b	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.662296
GF63a	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.004432
GF63b	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.046066
GF63c	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.185478
GF63d	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.000773
GF64a	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.009207
GF64b	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.028935
GF65a	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.003089
GF65b	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.246514
GF65c	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.320825
GF66a	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.0000292
GF66b	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.0000297
GF66c	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.073491
GF66d	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.21113
GF66e	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.233622
GF67a	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.192374
GF67b	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.0000296
GF87	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.005051
GF75**	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.006197
GF76**	Glens Falls	Warren	Spier - Queensbury 17	Fee-Owned	115	100	0.029078
GF49	Glens Falls	Saratoga	Spier-Butler 4	Fee-Owned	115	100	0.023218
GF50a	Glens Falls	Saratoga	Spier-Butler 4	Fee-Owned	115	100	0.144535

Label	USGS 7.5' Quadrangle	County	Electrical Transmission Line	Ownership Status	Voltage (kV)	Typical ROW width (ft)	Lupine Population Size (Acres)*
GF50b	Glens Falls	Saratoga	Spier-Butler 4	Fee-Owned	115	100	0.043974
GF51	Glens Falls	Saratoga	Spier-Butler 4	Fee-Owned	115	100	0.808993
GF101	Glens Falls	Saratoga	Spier-Mohican 7	Fee-Owned	115	100-125	0.784705
GF102	Glens Falls	Saratoga	Spier-Mohican 7	Fee-Owned	115	100-125	0.18102
GF103	Glens Falls	Saratoga	Spier-Mohican 7	Fee-Owned	115	100-125	0.147732
GF59 - GF62	Glens Falls	Warren	S-Q 5 - Ogden Brook Tap	Fee-Owned	115	75	4.4353
GF63e	Glens Falls	Warren	S-Q 5 - Ogden Brook Tap	Fee-Owned	115	75	0.056614
GF48b	Glens Falls	Warren	Warrensburg - Queensbury 9	Fee-Owned	34.5	65, 75, 100 (V, CL)	0.164801
GF53	Glens Falls	Warren	Warrensburg - Queensbury 9	Fee-Owned	34.5	65, 75, 100 (V, CL)	0.225475
GF52	Glens Falls	Warren	Warrensburg-Queensbury 9	Fee-Owned	34.5	65, 75, 100 (V, CL)	0.05126
NK83**	Niskayuna	Saratoga	Grooms Rd. - Johnson Rd. 13, Firehouse Rd. Tap	Fee-Owned	115	150	0.000023
NK84	Niskayuna	Saratoga	Grooms Rd. - Johnson Rd. 13, Firehouse Rd. Tap	Fee-Owned	115	150	0.143862
NK25	Niskayuna	Saratoga	Rotterdam-Bear Swamp E205	Fee-Owned	230	150	0.044926
SS29	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Fee-Owned	34.5	50-75 (CL)	0.469101
SS89	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Fee-Owned	34.5	50-75 (CL)	0.003618
SS88**	Saratoga Springs	Saratoga	Spier (Brook Rd.) - Ballston 11	Fee-Owned	34.5	50-75 (CL)	0.016678
SC85	Schenectady	Schenectady	Rotterdam - Curry Road 11	Fee-Owned	115	100-172 (V)	0.177452
SC06	Schenectady	Schenectady	Rotterdam - Woodlawn 35	Fee-Owned	115	100-172 (V)	0.233119
SC07	Schenectady	Schenectady	Rotterdam - Woodlawn 35	Fee-Owned	115	100-172 (V)	0.000773
VR12	Voorheesville	Albany	R-W 35 - Pinebush Tap	Fee-Owned	115	100	0.186616
VR08	Voorheesville	Albany	Woodlawn - State Campus 12	Fee-Owned	115	100	0.008159
VR09	Voorheesville	Albany	W-SC 12 - Pinebush Tap	Fee-Owned	115	90	0.053986
VR13	Voorheesville	Albany	W-SC 12 - Pinebush Tap	Fee-Owned	115	90	1.335526
SC05	Rotterdam Junction	Schenectady	Rotterdam - Curry Road 11	No Data	115	100-172 (V)	0.203627
VE92**	Verona	Oneida	No data in National Grid Files	No data	N/A	--	0.27993
TOTALS							**28.927797**

* These area calculations do not account for percent areal cover for blue lupine, but rather represent the size of each surveyed polygon.

** These populations were not previously surveyed or described by Dr. Leopold or the NYSDEC.

"CL" designates that National Grid has a centerline easement with trimming rights of varying widths.

"V" designates that the National Grid ROW width varies

Table 2: Surveyed Natural Gas ROWs within the Covered Lands that Contained Wild Blue Lupine Populations

Label	USGS 7.5' Quadrangle	County	Natural Gas Transmission Line	Ownership Status	Typical ROW Width (ft)	Lupine Population Size (Acres)*
GS42a	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy)	0.006701
GS42b	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy)	0.0000232
GS42c	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy)	0.065258
GS72**	Gansevoort	Saratoga	Pipeline E12-9 (Spier-Glens Falls 8)	Easement-Based ROW	50, 66, 100 (Hwy, V)	0.05199
GS94	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy, V)	0.001293
GS95	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy)	0.009998
GS96	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy)	0.058962
GS97	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy)	0.047937
GS98	Gansevoort	Saratoga	Pipeline E31-5	Easement Based ROW	12-20 (Hwy)	0.001113
QS90	Quaker Springs	Saratoga	Gas Pipeline E31-3 (Spier - Rotterdam 1)	National Grid Franchise Rights	12-20 (Hwy)	0.000773
QS91	Quaker Springs	Saratoga	Gas Pipeline E31-3 (Spier - Rotterdam 1)	National Grid Franchise Rights	12-20 (Hwy)	0.009575
SS30 & SS78	Saratoga Springs	Saratoga	PIPELINE E18-19	Easement Based ROW	50, 75, 100 (V)	0.404101
TOTALS						**0.6577242**

* These area calculations do not account for percent areal cover for wild blue lupine, but rather represent the size of each surveyed polygon.

** These populations were not previously surveyed or described by Dr. Leopold or the NYSDEC.

"Hwy." designates that the pipeline is located within the highway right-of-way by easement if it is a user road or by franchise if it is a dedicated road or by NYSDOT Permit. If a gas pipeline resides only on one side of the highway ROW, the distance from the edge of pavement to the edge of ROW could be 12-20 feet.

"V" designates that the ROW width varies

Table 3: Surveyed Non-ROW Parcels within the Covered Lands that Contained Wild Blue Lupine Populations

Label	USGS 7.5' Quadrangle	County	Adjacent Transmission Line	Ownership Status	Size (Acres)*
GF102	Glens Falls	Saratoga	Spier Falls - Mohican 7	Fee-Owned	0.096709
GF59-62	Glens Falls	Warren	S-Q #5 - Ogden Brook Tap	Fee-Owned	3.257143
GS104	Gansevoort	Saratoga	Spier-Glens Falls 8	Fee-Owned	0.010514
NGP-GF01	Glens Falls	Warren	S-Q #5 - Ogden Brook Tap	Fee-Owned	0.04524
NGP-GF02	Glens Falls	Warren	S-Q #5 - Ogden Brook Tap	Fee-Owned	0.000192
NGP-GF03	Glens Falls	Warren	S-Q #5 - Ogden Brook Tap	Fee-Owned	0.002485
NGP-GF04	Glens Falls	Warren	S-Q #5 - Ogden Brook Tap	Fee-Owned	0.017364
NGP-GF05	Glens Falls	Warren	S-Q #5 - Ogden Brook Tap	Fee-Owned	0.009618
TOTALS					**3.44**

* These area calculations do not account for percent areal cover for wild blue lupine, but rather represent the size of each surveyed polygon.

Appendix C:
Maps

Appendix D:
Transmission Right-of-Way Management Program:
October 1989, Revised May 2010

Appendix E:
Letters of Intent

Appendix F:
Funding Commitment Letter

Appendix G:
TNC Viability Assessment Criteria

Appendix H:

2010 APBPC Karner Blue Captive Rearing Protocol

ALBANY PINE BUSH PRESERVE COMMISSION
KARNER BLUE CAPTIVE REARING PROTOCOL

April 30, 2010

Captive-rearing efforts conducted by the Albany Pine Bush Preserve Commission and their approved agents will follow all permit conditions as provided by the U.S. Fish and Wildlife Service, the New York State Department of Environmental Conservation, and the New Hampshire Fish and Game Department.

Goal: Accelerate Karner blue butterfly colonization into restored habitat throughout the Albany Pine Bush Recovery Unit.

Objectives:

1. Capture fresh likely gravid female Kbb for transportation to rearing facilities as early in each Kbb flight as possible.
2. Facilitate egg laying in captivity.
3. Raise and release as many Kbb pupae as possible at designated restoration sites that have been demonstrated to have appropriate quantities of lupine.

Note that while it would be ideal to know how many butterflies need to be captured and released to successfully establish a new viable and self-sufficient Kbb deme, that information is simply not available. As recently as February 2008, the federal Kbb recovery team captive breeding sub-committee recommended that Kbb captive rearing programs aim to capture as many female Kbb as is deemed feasible and release as many Kbb into restoration sites as possible until monitoring demonstrates that a sufficient number of Kbb are present at the site. As of March 2008, eight (8) restoration sites are available as potential release sites.

Captive Rearing Facilities

Farnsworth Middle School, Guilderland New York: Dr. Alan Fiero
New Hampshire Fish and Game, Concord, New Hampshire: Steven G. Fuller, Ph.D.

Collection Sites (2010)

Saratoga Sandplains: NYSDEC lands within the Wilton Wildlife Preserve and Park area.
Pine Bush Southeast and Apollo subpopulations: Apollo Restoration, Apollo North & South, Discovery Center Field & SEFCU, Blueberry Hill East

First Flight:

As early in the brood as possible, (May 27-June 8, 2009) up to 40 recently-mated female Karner blue butterflies will be collected using soft cloth nets from sub-populations in the Albany Pine Bush and Saratoga Sandplains Recovery Units by NYSDEC staff or their designated agents. If possible females will be collected over a 2-3 day period to maximize the potential that females will be successfully mated and to optimize diversity in the collected individuals. Females will be collected in the afternoon on bright sunny and warm (60-80 degrees F) days. Females exhibiting signs of excessive wing-wear or too freshly emerged will not be collected.

Collected females shall be immediately transferred to temporary transport containers. These are simple 6 oz. plastic food containers with a vented lid supplied with an artificial nectar source consisting of cotton held in a .5 inch section of clear plastic tubing soaked with a 10-20% honey-water solution. Females will then be placed in a solid cooler and transported from the field to the rearing facility. Collected individuals will not be held in these containers longer than 5 hours including total time from initial collection to final transfer at the rearing facility.

 # to collect:

Fifteen – twenty (15) will be transported from Wilton to the NH facility.
Fifteen – twenty (15) will be transported from APBPC to the NH facility.

Second Flight:

As early in the brood as possible, up to 40 recently-mated female Karner blue butterflies may be collected using soft cloth nets from sub-populations in the Albany Pine Bush and Saratoga Sandplains Recovery Units, by NYSDEC staff or their designated agents. Females will be collected on a single day and immediately transported to the NH rearing facility. Females will be collected on bright sunny and warm (60-80 degrees F) days. Females exhibiting signs of excessive wing-wear or too freshly emerged will not be collected.

Collected females shall be immediately transferred to temporary transport containers and transported to the NH facility as described above. These individuals will be held in captivity in NH for the remainder of their adult life stage and/or released in Concord once egg laying is complete in compliance with NHF&G's USFWS permit. Eggs resulting from these female Kbb will be over-wintered in NH as part of their ongoing captive breeding program; the resulting pupae will be divided 90%/10% between the Albany and Concord release sites in the spring of 2010.

Captive Rearing Females

Farnsworth Middle School will not receive adult Karners in 2010. Rather FMS will receive not more than 100 1st and/or 2nd instar larvae from the NH facility in June. Larvae will be transported by NHF&G or APBPC staff.

In Concord New Hampshire first flight pupae resulting from 2009 over-wintered eggs will be divided 90% and 10% between NY and NH, respectively. Those kept in NH can be used for either captive breeding or release. Those held for captive breeding (with each other and 2009 newly captured wild GLA females) to benefit both the Merrimack River metapopulation recovery goals and the Glacial Lake Albany APB recovery goals. GLA females will be bred with GLA males. Housing conditions and durations will follow the NH Fish and Game protocols and permits.

The resulting second flight Karners will be distributed in the following quantities:

a) (80%) released as pupae in the Albany Pine Bush at designated restoration site(s)
b) (20%) held for captive breeding in NH. and/or released as adults in the Concord Pine Barrens.

Egg Collection

Note: NH protocol will follow their existing USFWS and NHF&G permits.

Captive Rearing Larvae

Note: NH protocol will follow their existing USFWS and NHF&G permits.

All containers and tools used in counting/collecting larvae **MUST** be washed in a 10% bleach solution and rinsed twice before use and again between each larval container to prevent the accidental spread of any diseases/pests/pathogens.

Larval rearing containers will be small 2 oz. clear food portion cups with lids. Containers will be stacked and placed inside clear plastic Rubbermaid storage boxes covered with clear plastic film. Each container is supplied with lupine cuttings to serve as a food source for developing larvae. When the larvae are small 2-3 may be held in each container but as second instar larvae most will be transferred to individual containers. In this manner of daily inspection, each larva is monitored through the duration of the rearing process. Each container is opened, larva accounted for, growth and health noted, host leaves discarded and replaced with fresh host leaves. Total number of larvae is recorded each day and all mortality events will be accounted for. Cleanliness becomes a real issue very fast as the developing larvae excrete significant amounts of frass. To reduce the chance of infection after first instar the larval rearing containers should be changed each day. This means transferring the individual larvae from

that day's container to a new container with fresh host leaves. All equipment used in transfer should be cleaned with alcohol after use. New fresh host plant leaves will be collected on a 1-2 day basis from local lupine plant sources but may also be collected from greenhouse or nursery stock if available. Old soiled containers would then be discarded. In the first instar stages this presents a tedious and repetitious task and extreme care will be taken to identify, locate and transfer each larvae. Magnifying hand lenses, forceps and paint brushes will be the tools used to transfer larvae. Most often larvae remain on host plant leaves so care must be taken to locate the larva before using forceps to pick up the host plant leaf to avoid crushing. Having the containers over a large flat white table will help considerably. As larvae develop, this process becomes easier and quicker but more host plant is required and significantly more frass is produced. After about 10-14 days most larvae have reached fourth instar and begun the process of pupation. Larvae will slow down and often become fixed at a point on a host leaf or the base of the container. Larvae will stop feeding at this time. Larvae contract and the exoskeleton begins to harden and take the shape of the pupa. Once this occurs each pupa should be removed from the host leaf to avoid mold growth and transferred to a pupal container. Final number of larvae reaching pupation is recorded.

Captive Rearing Pupae
Farnsworth Middle School and Concord NH:

All containers and tools used in counting/collecting pupae **MUST** be washed in a 10% bleach solution and rinsed twice before use and again between each pupal container to prevent the accidental spread of any diseases/pests/pathogens.

Pupae will be transferred to larger 4 oz. food portion cups with lids. As pupae developed they will be held together in the same age groups with up to twenty pupae per container. Pupae will be kept separate depending on which female they originated from. Pupae will also be monitored daily for the onset of eclosion. As the green pigment begins to turn to light brown and then the darkened eye spots begin to form the pupae are ready to be placed in release nets. These pupae are then placed in simple 10-12 oz. plastic food containers including some grass stems criss-crossing through the food container to serve as supports and climbing structures in case of premature eclosion. Once all pupae have been inspected and those ready to go have been determined, the transfer containers are then taken to the field to be placed in the release nets.

Release
The 5.5 -acre "Chubb" site as well as the sites of the 2008 and 2009 Kbb release (Antelope, Barrens House Fields and Blueberry Hill East" restoration sites are the targeted 2010 release sites in the Albany Pine Bush Preserve. Additionally, at least 40 pupae will be release at the Apollo North site, and if sufficient pupae are available they will also be released at DC Field.

To reduce mortality in the release nets, they must be placed along the forested edge of a field, or otherwise beneath some protective natural cover. To further reduce pupal mortality no more than 50 pupae should be placed in any given release net at one time.

Release nets are inverted hard-hats, placed within inverted mosquito nets, suspended beneath a large squirrel baffle with the neck opening facing upwards and suspended by fishing line from a Sheppard's Crook. The squirrel baffle will keep rain from soaking the interior of the release net. Enough space is allowed for adults to climb up to the opening and fly away freely. The hard hats are also lined with mosquito netting, which suspends the pupae above the bottom of the hard hat, reducing any chance of inundation during heavy rain events. Release nets are secured with fishing line from the base of the hat to the bottom of the Crook. The fishing line, Crook, and baffle hanger are also coated with Vaseline to keep ants at bay. Pupae are simply placed in the bottom of the release nets and then left to eclose unassisted. Adults usually emerge in the morning, climb up the sides of the nets, unfold and allow their wings to dry and harden and then fly out the top opening. Any pupae that do not complete metamorphosis will be discovered when the nets are taken down about 10 -14 days following the last placement of pupae. The final number of adults released is then recorded.

Monitoring Kbb at Release Site(s):
Kbb population monitoring will be initiated once adults begin to eclose and emerge from the release nets. Monitoring will employ straight-line index transect counts throughout the release site(s) following methods used for other occupied Kbb sites. Monitoring will continue for all subsequent years, until the population is sufficiently large to facilitate Distance sampling or is no longer considered occupied. All release nets should be collected 15 days after the last pupal release and dead pupae in each net recorded. To aid in refining pupal release protocol, pupae data should be specific to each net, and not pooled across sites or nets. Any pupae remaining after 15 days that do not appear diseased will be held at the Commission offices in containers at room temperature for another 7 days, before being presumed dead.

Low Tech Low Budget
Most of the captive rearing and release project can be done with low tech low budget materials and methods. The greatest investment of time occurs during the initial egg harvesting and larval rearing stages. In order to rear 500 individuals it would require a full-time investment by a two person staff through the duration, although the work load becomes easier as the larvae mature and increase in size and a one person staff may be capable of handling the processing. Full-time includes at least an 8-10 hour day spent processing 7 days a week for about 3 weeks. Over the last 2 weeks the larvae begin to pupate, fewer daily changes are required and the processing becomes faster. Eventually toward the end of the rearing process just a daily check of the status of the pupae is required.

Materials

Potted lupine host plants
Host plant light mesh fabric
String
Florist sipper tubes
Cuticle scissors
Eye dropper (for honey solution)
Cotton
Forceps
Clear plastic tubing
6 oz. food containers
10-12 oz. food containers
2 oz. food portion cups
4 oz. food portion cups
2 oz. food portion cup lids
4 oz. food portion cup lids
Marker
Labels for marking host plants
4-8 plastic storage containers
Clear plastic film
Magnifying hand lenses
Honey
Distilled water
Alcohol
Dried grass
Mosquito hats
Fishing line
Vaseline